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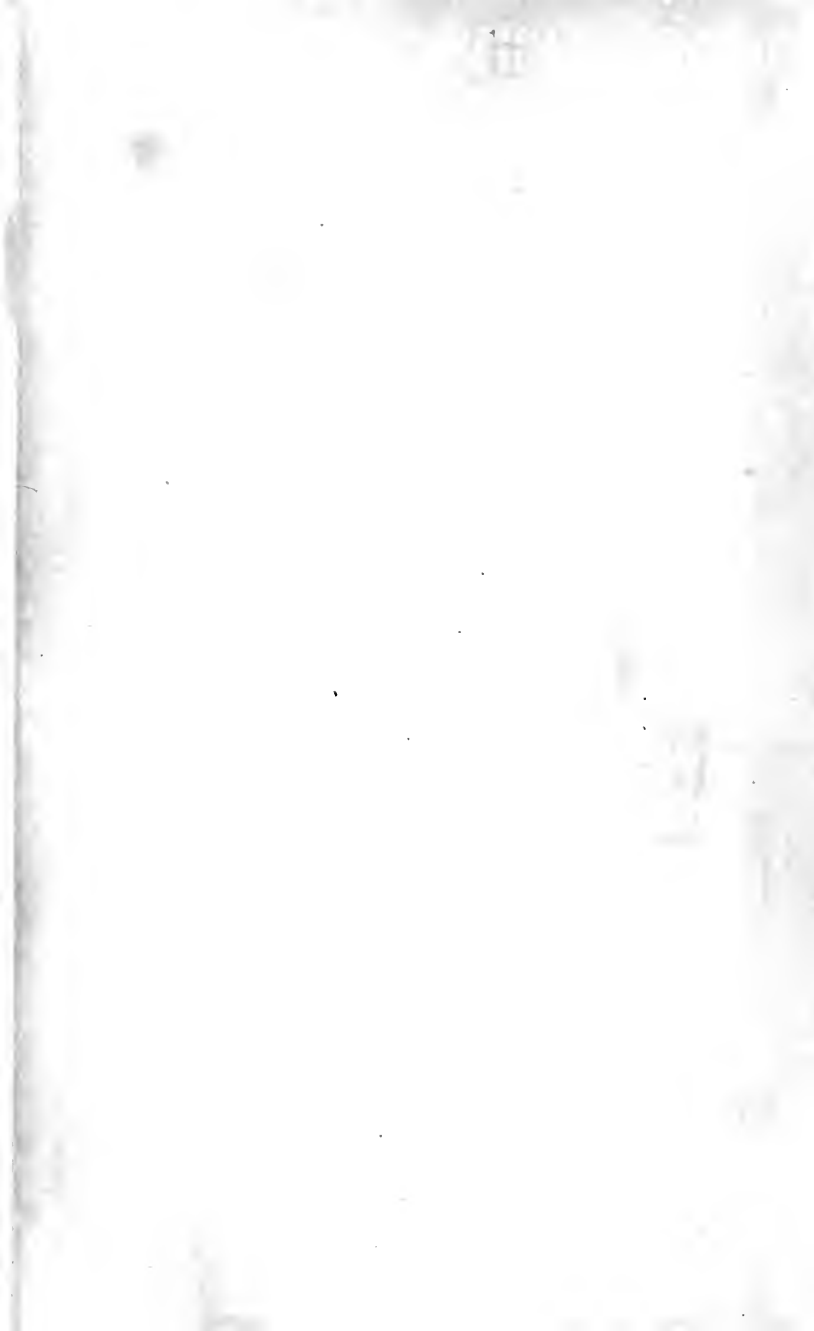


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PACIFIC SERVICE MAGAZINE



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Reports

Construction

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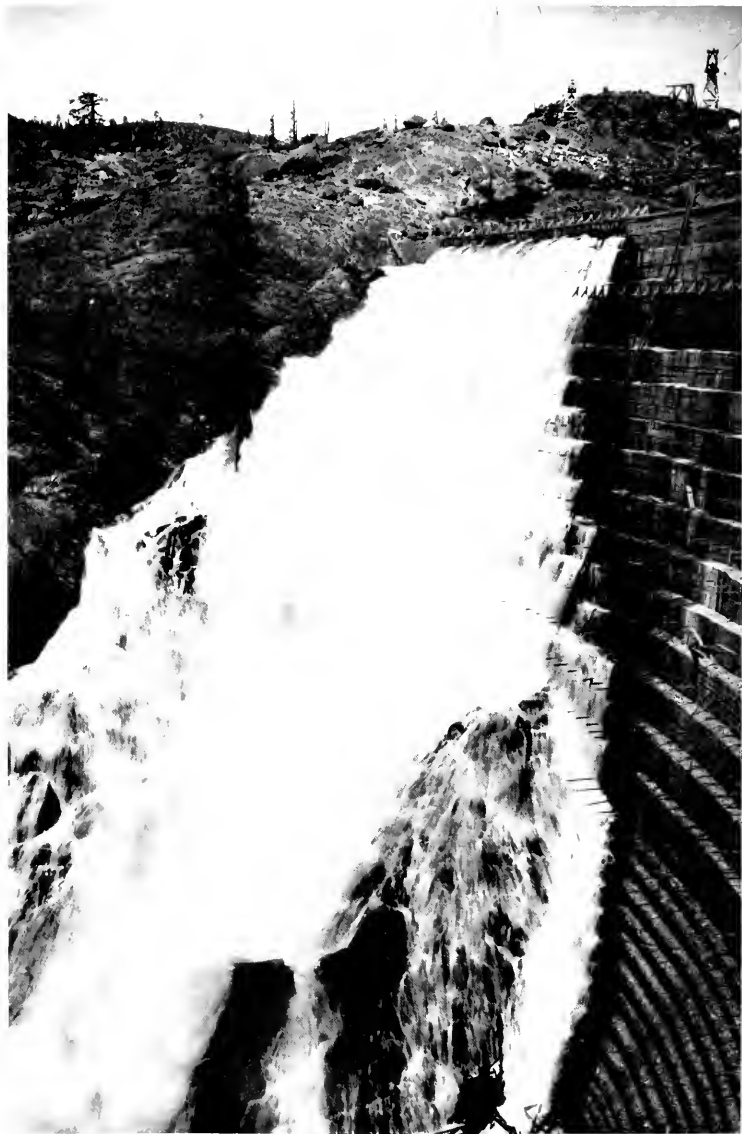
Contents for June

THREE THOUSAND CUBIC FEET PER SECOND!	<i>Frontispiece</i>
LAKE SPAULDING AN IMPRESSIVE SPEC- TACLE, ITS WATER POURING IN MIGHTY CATARACTS OVER THE SPILLWAYS	<i>F. S. Myrtle</i> 3
ON RELATION OF EMPLOYER AND EMPLOYEE REPORT OF AN ADDRESS DELIVERED BY	<i>Jno. A. Britton</i> 10
SALIENT POINTS IN OUR ANNUAL REPORT	14
"PACIFIC SERVICE" PLAN FOR PERMANENT FINANCING	18
ITEMS FROM WOMEN OF THE COMPANY	22
"PACIFIC SERVICE" SECTION, N. E. L. A.	23
PANORAMIC VIEWS OF THE NEW LAKE SPAULDING	24
WHAT THE N. E. L. A. IS AND WHY YOU SHOULD BECOME A MEMBER	<i>Ernest B. Price</i> 26
EDITORIAL	28
THINK "SAFETY FIRST"! IT SAVES YOU MONEY	<i>J. P. C.</i> 30
THE HALF-WATT NITRO LAMP	<i>J. P. Baloun</i> 31
JOTTINGS FROM DISTRICTS AND DIVISIONS. NOTES ON MARYSVILLE SECTION, BY J. E. POING- DESTRE. NEWS OF THE COMMERCIAL DEPART- MENT BY STANLEY WALTON	32
P. G. AND E. TENNIS TOURNAMENT	36
THE JAMES HUGH WISE LIBRARY	<i>J. P. B.</i> 36
DIRECTORY OF COMPANY'S OFFICIALS	i
MAP OF COMPANY'S SYSTEM	ii
CITIES AND TOWNS SUPPLIED BY "PACIFIC SERVICE"	iii

Index to Advertisers

Allis Chalmers Mfg. Co.	xi
Associated Oil Co. 3d page cover	
Byron Jackson Iron Works.	ix
Chaplin-Fulton Mfg. Co.	ix
General Electric Co.	xi
General Gas Light Co.	ix
General Specialty Co. 3d page cover	
Halsey, N. W., & Co. 1th page cover	
Harron, Rickard & McCone.	iv
Johns-Manville, H. W., Co.	xvii
Mark-Lally Co.	xvii
Pacific Telephone & Telegraph Co. 2d page cover	

Patrik & Co.	x
Pelton Water Wheel Co.	x
Piereson, Roeding & Co.	xvii
Remington Typewriter Co.	xvii
Roebbing's, John A., Sons Co.	xvii
Schaw-Butcher Co.	x
Sprague Meter Co. 3d page cover	
Standard Underground Cable Co.	ix
Stelger & Kerr Stove & Foundry Co.	xvii
Westinghouse Electric & Mfg. Co.	x
White, J. G., Engineering Corporation 2d page cover	
Wood, R. D., & Co.	x



It is estimated that water escapes over the spillway on Lake Spaulding dam at the rate of 3000 cubic feet per second.

Lake Spaulding Furnishes Impressive Spectacle, Its Waters Pouring in Mighty Cataracts Over the Spillways

By FREDERICK S. MYRTLE, Manager Publicity Department

ON June 2d, last year, I stood with Chief Engineer Baum upon a rock above the South Yuba River, at a point just below Lake Spaulding, and looked down upon a gang of workmen splashing about in the stream-bed below, engaged in removing a small mountain of rock that, through an overcharge of blasting powder, had all but obliterated the foundation of the new dam then in its initial stage of construction.

On June 2d, this year, I stood upon the same rock and beheld a mighty cataract plunging over the spillway to one side of the crest of a mighty monolithic structure that towered 225 feet above the stream-bed. On the up-stream side, al-



F. S. Myrtle

most level with my eye, the waters of a new Lake Spaulding glistened in the sunlight as they lapped the guard-rail on the dam's crest.

What a change in a twelve-month! True, there were stages in between when I had a chance to note progress, as, for instance, when I accompanied a company's party to Lake Spaulding last December and formed one of an admiring crowd that stood upon the newly-finished dam and gauged depths from its summit; but there the invitation to a headlong plunge came from either side, while now but one, the down-stream side, presents opportunity of that description; one walks off into water on the other.



The new Lake Spaulding, with the water rushing over the dam, is plainly visible from the eminence to the left of the road above Emigrant Gap.



View taken from the dam crest, which is at water-level on the up-stream side. Black Mountain and Old Man Mountain are conspicuous in the background.

In a word, the Big Job has made good.

There are startling changes in the landscape from twelve months ago. Lake Spaulding was then a modest body of water, not more than 250,000,000 cubic feet in capacity, hemmed in by more or less precipitous bluffs. It is in the summit region of the Sierra Nevada, and a black line upon the hillside to the south indicates the course of the Southern Pacific overland as it puffs its way up to the apex not many miles distant. It is a region of rock and scrub, with here and there a clump of fir to relieve the eye; but it is a region dear to the heart of every man who loves the free open air of the mountains and who has had a chance to wander there in days whether of leisure or of toil. It is an historical region, too, made famous by Western writers whose books hold honored place in public and private libraries all over the world; for it marks the course of the old emigrant trail.

Well, those bluffs I referred to, that is, those that are high enough, are there yet, but not so formidable now that the lake has risen; and it seemed to me as I gazed over the landscape that those

lofty sentinels in the background, such as Grouse Ridge, Old Man Mountain, and Red Mountain with its signal peak, were brought nearer than they were before.

But, after all, the grand sight is the rushing water. It has been rushing for some months now, and it will continue to rush for many months to come.

One obtains one's first view of the changed conditions from an eminence to the left of the road above Emigrant Gap. That is the highest point in the journey across country from Colfax, and those familiar with the road will remember that at the Gap the road divides, to the right leading across the railroad track and on to Cisco and the summit, to the left leading down to Bear Valley and on to Smart and the lake. Well, if you will halt your automobile upon the road looking down upon the snowsheds at this highest point and will clamber up the eminence to the left, you will behold a spectacle that will well repay you for your, perhaps, unusual exercise. To the right, as I have stated, lies the old town of Emigrant Gap, almost under your feet, and beyond is the American River canyon. To the left, looking down you see

Bear Valley spread out underneath you like a green velvet carpet, with its reservoir that marks the head of old Boardman canal; and, directly in front of you, your eye traveling over rocky eminences that would hide the view from you were you one hundred feet or so lower down, you behold a handsome body of water, to the left of which appears an irregular white stream apparently pouring sideways over rocks. That is the new Lake Spaulding, with something like 3000 cubic feet of water escaping every second over its main spillway.

If you have an expert eye you may see another smaller patch of white in the midst of a forest growth to one side of the lake; that shows where the water marks a course for itself as it pours over a smaller spillway on the north side of the lake.

It is one of the sights of that region, and I understand that orders have been issued that a signboard shall call it to the attention of pleasure-seekers and others who pass to and fro on the great highway between the State of Nevada and this Golden State of ours.

At the lakeside the experience of one who noted progress through the construction period is a novel one. During the period referred to the hum of industry broke upon the great silence of that peaceful region. Today the place has somewhat the appearance of a deserted mining camp. The workshops are closed,

the men are gone. Evan Magnuson, the sturdy Norwegian lake-tender whose quaint habitat of some seventeen years was swept away by the rising waters, now occupies a wooden house in what was Camp No. 1. There are two assistants with him just now, and the three together form the entire population of the locality whose postoffice is called Ohm.

But the vanished hum of industry is made up for by a new sound—the roar of the water as it escapes over the dam and to the freedom of the South Yuba. The sound is pleasing to the ears of Mr. Britton and his engineers, for it means that the Lake Spaulding dam is doing its full duty and, through its agency, so are Drum canal and the power-house in Bear River gorge, some nine miles below; but this feeling of satisfaction, too, may be tinged with regret, for no engineer likes to see so much power go to waste as is indicated by the huge cataract that pours over the spillway. But it is enough, for the present, to know that our initial development is living up to the fullest estimates. By and by we are going to put eighty feet more concrete on top of that dam; when we do, those little bluffs I spoke of will be islands, and Grouse Ridge and Old Man Mountain and Red Mountain will come nearer yet in the perspective.

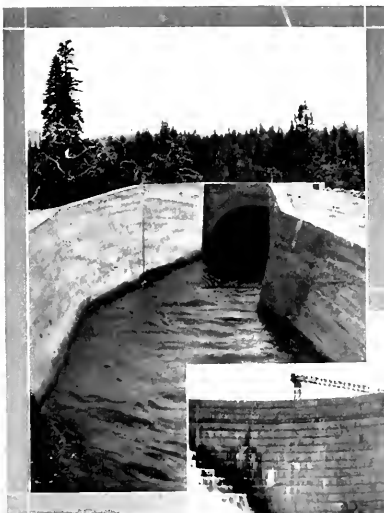
"We keep her filled," said lake-tender Magnuson complacently. Then he re-



Drum forebay is now an imposing body of water, of 100 acre-feet.



The scene at the north spillway is quite a sylvan one.



called that the lake started to fill about the middle of last November and that those on the ground had their work cut out to keep it down so as to give the newly-laid concrete a

chance to set. "It meant waste of lots of water," explained Magnuson, "but the water kept a-coming, and so fast that finally we concluded to let her come."

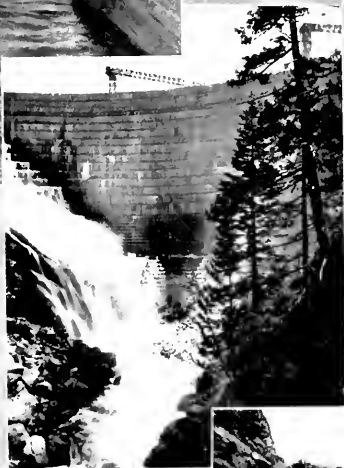
"Forebay, Meadow, Van Norden and Sterling lakes were all shut down as soon as the dam began to fill. Today all the storage reservoirs are full, that is, as full as we dare let them be at the present time."

After exploring the dam, whereof the photographer who accompanied me took many pictures, we crossed over to the north of the lake and hiked over the rocks to the north spillway. As a matter of fact, there are two

spillways on the north, one much smaller than the other, and together they turn that north shore into an almost sylvan scene, for the water from each comes tumbling down in an irregular rocky course through a thick wood. You feel like sitting on the rocks and eating lunch and smoking and letting your thoughts wander as the water rushes past your feet. The spectacle is entirely different, of course, to that at the main dam. It

is less grand, perhaps, but it seems to you that in proportion to their size the little spillways make more fuss than the big one.

As you leave Spaulding and follow the course of Drum canal you find everything in ship-shape order. The canal is working to a capacity of about



1. Water in Drum canal ends near the forebay. 2. Over Spaulding dam into the South Yuba. 3. Lower view of South Yuba flume.



The 1375-foot drop to Drum power house, a 45-per cent grade.

200 cubic feet per second, and the fore-bay at the end is now a handsome sheet of water of about 400 acre-feet capacity. The huge pipe that leads therefrom over the hill and down to the 1375-foot steep to the power-house is well in place, and in the gorge below the whirl of the generators is unceasing as they grind out the electric "juice" that starts from there upon its 110-mile journey to the shores of San Francisco Bay, over the wires that are stretched between steel towers that take a bee-line over the hill on the other side of Bear River.

The "Big Job" has made good all along the line from Spaulding to Cordelia, from the peaks of the Sierra Nevada to the bay of San Francisco. There is not on record a hitch in its operation. Reservoir, dam, tunnel, canal, fore-bay, penstock, power-house, transmission line, each has played its part to the full expected of it.

For those who would like to know something about the dates of progress, I will mention that the records show that on October 3d last, Lake Spaulding dam hav-



View of the interior of Drum power-house, showing generators, exciters, transformers, switchboard, etc.

ing reached the point where it was found advisable to make use of it, the sluiceway under the dam was closed and the water's escape shut off thereby.

On November 21st the gates of old Lake Spaulding were opened and the freed waters backed up against the dam to a height of 106 feet, sufficient to send water through the tunnel in the rock at the south side leading to Drum canal and to cover that tunnel to a depth of 36 feet.

The first water was sent through the tunnel the following day, November 22d, and poured into the canal and on to the forebay. It was deemed advisable to go slow at first, for obvious reasons, and so a very small quantity, some 300 miner's inches, was all that was allowed to pour through the 6-inch by-pass in the main 72-inch butterfly valve.

But the following day, November 23d, the big valve was opened and there was turned into Spaulding tunnel 2000 miner's inches of water. On November 25th, the

forebay was filled and everything was in readiness for the initial trial of the electric generators in Drum power-house.

On November 26th, the day before Thanksgiving, Mr. John A. Britton, who had traveled up there for the purpose, closed a switch that set the whole development in motion. The following dispatch sent out by Mr. Britton from Drum told the result of the test: "Drum synchronized with 'Pacific Service' at 10:56 today. Everything from Spaulding to Cordelia in perfect harmony."

From that time on Lake Spaulding slowly filled. The heavy rains in January last helped out in that direction and, notwithstanding the heavy draughts on storage that were made to prevent too rapid filling, the rain beat the engineers. On January 31st the water poured over the main spillway for the first time. It has been pouring ever since.

So, as I said before, the Big Job has made good.

On the Relations of Employer and Employee

Either Has Rights Which the Other Should Recognize — Industrial Equilibrium Necessary to the Progress of Any Community

On the evening of Wednesday, May 27th, there was held in the city of Stockton the largest gathering of business men ever known to have congregated in the county seat of San Joaquin. The call was sent out by the Merchants', Manufacturers' and Employers' Association and included representative men from the entire bay region, and so generous was the response thereto that the ballroom of the Hotel Stockton, the chosen meeting-place, was crowded to capacity with merchants, manufacturers, jobbers and retailers, practically all either owners or managers of business undertakings.

There were several speakers, the main subjects of discussion being the purposes of the association and the attitude of the employer toward organized labor. "Fairness to the Employee and Industrial Equilibrium" seemed to be the burden of all the talks. Cards were distributed among the audience bearing this legend:

"SOME THINGS WE BELIEVE IN."

- "That no community can prosper unless it maintains industrial equilibrium.
- "That employers and employees have equal right to organize to further their lawful interests.
- "That every free citizen has a constitutional and moral right to an honest living, regardless of whether he is a member of any organization.
- "That boycotting, picketing, restriction of output and sympathetic strikes are menaces to the progress of a community.
- "That reasonable hours of labor give employment to a greater number of people and, coupled with good wages, put a larger amount of money in circulation.
- "That differences between employers and employees should be harmonized with justice to all concerned."

On the list of speakers was our Mr. John A. Britton, who delivered a comprehensive, well-considered address upon the relations between employer and employee. Mr. Britton spoke from the standpoint of a large employer of labor who recognized to the full the right of the wage-earner to organize for his own protection and betterment and who, at the same time, saw nothing but hindrance to the progress of the commonwealth in protracted and, often, unnecessary disputes between capital and labor. He favored the "give and take" policy, embracing consideration on the part of the employer and reasonableness on the part of the employee. For the benefit of our readers we present the following report of Mr. Britton's address as it appeared in the Stockton "Daily Evening Record" of the day following the meeting:

"THERE is, perhaps, no question before the people of this or any other country today of as great importance as the great question that goes into the fundamentals of the relation between employer and employee.

"In the consideration of this problem the differences existing between the characters of employment must be thoughtfully worked out. Prior to the world as it exists today of busy, bustling humanity, the creation of great

cities of steel and concrete, the necessities of transportation of materials and men over the vast expanses of the several civilized continents, and the introduction of labor-saving material, the relation as between employer and employee was largely that of master and servant engaged principally in agricultural pursuits and such small manufactures as were essentially necessary for domestic comfort. Nearly, if not all of the materials used in daily occupations were

hand made, woven in the woof and web. All relations between the master and servant were those of ties closer than can possibly exist today, because of social, economic and political causes.

THE SEEDS OF SOCIALISM.

"Within the last thirty years the wonderful and marvelous progress of electrical science and the evolution of ship building from the wooden boats to those monster leviathans of steel called for a greater amount of intelligence on the part of the employees than had been required of them before. Necessarily, there came then to the ranks of the employees men of greater intelligence and greater thought, of more insistence of purpose than the mere provision for their daily living, and the seeds of socialism sown in the minds of many foreigners at the autocratic behavior towards them by the aristocratic portions of old Europe found lodgment in the minds of the working men of America, and the propaganda of socialism was disseminated by the press of this country, primarily as a means of attracting financial attention to their ventures, and secondarily, in the general humanitarian view of the uplift of the masses.

UNIONS POWER FOR BETTERMENT.

"Within the ranks of the working man were found just as much of intelligence and financial ability and of organization ability as was found in the ranks of financiers or employers of labor, and as a protective measure the unions of working men were founded, primarily for their own betterment and the betterment of their trades, and became a wonderful power for the betterment of their working conditions.

WORKMEN'S COMPENSATION ACTS.

"I dare say there is not a man today who can oppose the principle of the right of the employee to organize himself into a protective association for the betterment of his condition, and in

the better classes of employment that right is not only recognized, but encouraged. The demands of modern civilization recognize that the working man is entitled to be protected in his employment by reasonable means and methods to be furnished by the employer, so that the risks of his employment shall be reduced to a minimum; and enlightened civilization and legislation has provided for such protection by means of what are commonly known as workmen's compensation acts. As in all of these matters of legislation involving present expense upon the producer, the ultimate consumer must pay, for it is logical that little or no objection can be raised against such legislation provided it protects the employer as well as the employee.

"This is not only true of matters involving responsibility of the employer in the protection of the employee, but it goes also to the question of providing him proper places in which to work and providing for proper sanitation of the same. In other words, it is bringing the two elements necessary in the up-building of any commonwealth into a common ground of consideration, and is removing gradually the antagonisms that have heretofore existed by reason of the disregard generally on the part of the employer of the rights and privileges of those employed.

MUST OBSERVE RIGHTS OF BOTH SIDES.

"I bear no brief to you in defense of either the employer or the employee, but I am seeking tonight, in the preface which I have given you so far, to illustrate what to me has seemed to be a reasonable ground for differences existing. On a broad, general principle it is not only proper and right, but humane and logical, that there can be no participation of effort as between two correlated bodies unless the rights of both are strictly observed. No one can deny that as a general rule the working men of the past have suffered from

inequalities and from discriminations which were not justified, excepting by reason of that animal instinct which all human beings possess to a large degree, of attempting to control those over whom they have authority and power.

"In modern days and in the light of relations that should exist, there is only one condition which justifies that extreme domination, and that is where necessity for war exists, and the control which holds men of varied minds and temperament together must then, of course, be of a highly disciplinary character.

EMPLOYER'S CONCERN FOR HIS EMPLOYEES.

"Employers should and must give deep and earnest consideration to the welfare of the employee. In my recollection—extending over a period of forty years, and before unionism began to insert itself strongly into diversified trades and pursuits—the relations existing as between the employer, in the person of the agent of those financially interested, and the workmen under him, were the relations of friends. Personal daily contact made each man known to his immediate superior, and concern was had not only for the workman himself, but for his home and his children, and efforts were continually being made for their betterment.

"As work became more strenuous, the length of hours of employment, which had been a rule and apparently was not a burden, was, because of the necessities of economic administration, more or less lessened, and, as cost of living by reason of the necessities of keeping up with the procession of urgent today demands became higher, better wages were paid.

"This gave opportunity to the thinker of the working class to produce such a union of interests in all allied industries that by combination men could accomplish more than they could by individual application, because as demands upon the workmen increased and their

numbers multiplied, the contact as between the governing head of any institution employing labor and the employee widened and gradually disappeared.

"Combinations are made of capital, of industries and of political matters. No success would attach to any movement unless it were thoroughly organized and disciplined.

WHEN ORGANIZATION IS A BENEFIT.

"These are the excuses for present conditions, and, in my belief as an employer of labor, if an organization can be perfected and maintained along sane lines, the employer and the employed are materially benefited by such organization. Unfortunately, into the rank and file of union labor organizations there has crept more and more, as demands were easily acceded to, the anarchistic and socialistic spirit that goes to the prevention of assimilation, and is productive of continual unrest and trouble.

THE LABOR LEADERS

"The recognized labor leaders of the country are, as I have met them, men of more than ordinary intelligence, ambitious for power in their own ranks, ambitious to achieve the name among their fellows of philanthropists, unmindful, however, as to whether that reputation is made at the expense of the employer or the public or his co-laborer. The working man only sees that his organization has for years benefited him in more of the comforts and conveniences of life for himself and family, more of leisure to pursue, as may be his bent, his favorite occupation of leisure. He binds himself by oaths and ceremonies to the observances of rules and regulations made for him and to which he is no party (in that, however, he is not different from those who similarly ally themselves with certain fraternal organizations), and when the crucial time arrives when there is a dispute between his organization and the employer, he alone is the sufferer. He is partially compensated by means of a benefit which

is derived from a fund that he is a contributor to, and he minimizes the suffering that he endures and gives the reason that for the limited times that they occur he is no worse off than were his forefathers before him.

"I am neither in favor of an open shop nor a closed shop, as these expressions are commonly used. I am strongly in favor of reasonable agreements between men, and I am not in favor of the petty politicians on either side of the fence that seek to create and ferment trouble as between them both.

"Labor has a place, organized or disorganized, in the material makeup of a nation's progress and development, and must be so recognized; but it must take its place alongside and not in front of capital that creates and ennobles and assists it.

"It must not deter, hinder or impede the progress of the nation. It must not dictate unreasonable terms, and it must not, in the attempted enforcement of those terms, resort to the days of savage brutes to gain its end.

"It must resolve to be dominated by logic, reason, firmness and equity and not by force or threat.

GOOD CITIZENS.

"The rank and file of the army of employees are as good citizens as you

or I. They are filled with the same ambitions, desires and hopes. They are law-abiding and patriotic. These virtues we must grant to them. They can and do differentiate as closely as we between the elements of right and wrong in the disputes that arise, and the large majority deplore the action of their leaders when compelled to lay down their tools and become one of a band who, for the time being, have their hands raised against law and order.

"Let us analyze this particular condition. Is it hope of a betterment? Is it anger at or distrust of his employer? No! With the masses it is fear, absolute and abject, of physical violence—fear of becoming a pariah, fear of that terrible thing to all men, of being shunned and ostracized by his friends and neighbors; fear that if his leaders are successful, he, if he remains loyal to his employer, may find himself in the position of seeking elsewhere for his daily bread.

"Now all this fear he can be robbed of if he learns to have confidence in his boss—if he feels that in the interest of his pocketbook alone the boss will not sacrifice him on the altar of financial gain. Gain the confidence of your men first. Have about you, by reason of your treatment, loyal men and true."



An Advertising Man's Story

He was a real estate dealer in Tacoma, by the name of Cook—a genial, jolly sort of man, and a great booster for the town.

A friend, meeting him one morning, said:

"I see that you are spending a lot of money advertising these days, Cook."

"Why, no," replied Cook, in surprise. "I haven't advertised at all lately."

"Is that so?" queried his friend, "I

thought of course that was your ad that we see all over town—'Cook with gas,' you know."

The real estate man joined in the laugh. But, the next morning, the joker was surprised to find in the papers a large advertisement headed with these words in big type: "Cook with Gas, or Gas with Cook. The One Saves You Money, the Other Makes You Money."

Salient Points in Our Annual Report

THE eighth annual report upon our company's affairs issued to the stockholders recently is the most comprehensive, and goes most into detail, of any report presented since the company's organization.

It has been received everywhere with satisfaction, and the press comments upon it have been most generous. The San Francisco "Examiner" in its issue of June 4th said:

"The eighth annual pamphlet report of the Pacific Gas and Electric Company, which reached this desk yesterday, contains a far more thorough analysis of the composite units of the company's business than any report heretofore issued."

The San Francisco "Chronicle" on the same date observed:

"It is easily the most complete and the ablest document covering the operations of a public utility ever issued on this Coast, if not in this country."

It is a volume of forty-five printed pages, containing full statistical and financial details. In addition, there are photographs, colored maps and diagrams, with the aid of which any stockholder sufficiently interested may obtain most complete information concerning the company's system and operations. Every care has been taken to omit no essential facts relative to which any inquiry may be made.

The report bears the signature of President Frank G. Drum, for the Board of Directors. It opens with the following table showing the total business for the year 1913, with the percentage of gross earnings contributed, respectively, by

each branch—gas, electricity, railway and water:

	YEAR 1913	
Gross Earnings from sales of Electricity	\$8,330,782 or	51%
Gross Earnings from sales of Gas	6,547,595 or	40%
Gross Earnings of Sacramento Street Railway System	572,913 or	4%
Miscellaneous Income and Gross Earnings from sales of Water for irrigation and domestic purposes	851,047 or	5%
Totals	\$16,202,337 or	100%

The report shows this business distributed as follows: Cities and towns supplied with electricity, 214, with an aggregate population of 1,221,123; 51 supplied with gas, population 1,124,893; 28 supplied with water for domestic purposes, total population 58,905; 1 city, Sacramento, supplied with street railway service, the population of the capital city being given as 75,602.

Statistics for the past six years show that in that period the number of consumers of gas increased from 122,304 to 208,269; of electricity from 55,704 to 132,355; a gain of 70 per cent and 138 per cent, respectively, by these two most important branches of the company's business. The greater increase in consumption of electricity is particularly attributed to the recent branching out in the agricultural field, "electricity on the farm" calling for a rapidly growing demand upon the company's resources. It is estimated that this branch of the company increased 114 per cent last year.

The stockholder is afforded an excellent idea of the growth of each item that goes to make up the sum total of the company's business by a classification of revenues on the basis of sources from whence derived. Here are the figures pertaining to sales of electricity for 1913:

CLASSIFICATION	YEAR 1913	YEAR 1912	INCREASE
Commercial and Residential Business	\$3,642,836.95	\$3,457,061.85	\$185,772.10
State, County and Municipal Business	662,566.21	680,339.19	-17,772.98
Sales of Power—Agricultural Industry	419,092.83	195,883.72	223,209.11
Sales of Power—Mining Industry	557,461.76	576,785.22	-19,323.46
Sales of Power—Transportation Industry	696,324.41	627,763.14	68,561.27
Sales of Power—Manufacturing Industry	1,476,104.59	1,436,643.66	39,460.93
Sales of Power—other Electric Light and Power Corporations	343,429.94	305,162.64	38,267.30
Sales of Power—Commercial and Miscellaneous	431,337.41	391,566.83	39,770.58
Temporary Lighting and Power	1,627.81	1,361.25	266.56
Totals	\$8,330,781.91	\$7,672,570.50	\$658,211.41

The high load factor is an important point of discussion in this report. It is dealt with as follows:

"Electric power is at this time being supplied to no less than 115 types of industries in the fields of agriculture, mining, manufacturing and transportation. Eleven electric railway systems, operating 594 miles of road, derive their power from the company's plants. The connected load on the entire system increased by 56,108 horse-power in 1913, and the already high load factor rose from 58.6% to 59%.

"The costs attendant upon the operation of hydro-electric plants are practically all fixed. In a lesser degree this is also true of steam plants. It is, therefore, extremely desirable that such plants be worked as nearly as possible to their full capacity, and the upbuilding of an "off peak" or power load is somewhat analogous to that of a railway striving to reduce its empty car mileage, or of a bank seeking the maximum employment for its loanable funds. The significance of the company's load factor of 59% may be inferred from the fact that the load factors of the electric companies operating in the largest cities in the country, namely, New York, Chicago, Philadelphia, Brooklyn and Boston, ranged from 33% to 40% in 1913. The company's favorable position in this respect is attributable to the large power load it has steadily built up practically from the time of the first utilization of the State's water power resources for the production of electric energy."

The contract with the Panama-Pacific International Exposition Company for

branch of the service is given from the record of 1913, showing that in the San Francisco steam plant alone the output during the year was 115,244,960 K.W. hours of electric energy.

The gas department shows seventeen gas plants in use, of a total daily capacity of 44,710,000 cubic feet. The distribution system shows 2,374.18 miles of gas mains and 182,914 gas services laid during the year. The number of gas street-lamps is given at 8,924.

The Street Railway Department shows an increase of 61 per cent in gross revenue during the past seven years. The Water Department shows an increase of 60 per cent in gallons of water pumped.

The average number of company's employees in all department during the year 1913 was 6,778 as against 6,110 in 1912; the total salary and wages paid amounted to \$6,955,817 as against \$6,157,528; the average annual compensation per employee during 1913 is given as \$1,026 as against \$1,008 the previous year. In this connection the report furnishes the following information obtained from the Bureau of the Census with respect to the average compensation of employees in central electric light and power stations and in the gas industry in the entire United States and in California:

	ENTIRE UNITED STATES	STATE OF CALIFORNIA	WAGES HIGHER % IN CALIFORNIA BY
Commercial Electric Stations (1912)...	8779	81,018	30%
Gas Industry (1909)...	657	879	33%

all the electricity and gas to be consumed by it is mentioned, and a chapter is given to the South Yuba-Bear River development by way of showing the means taken by the company to meet the ever increasing demand for electric energy. The steam-electric stations, those very necessary adjuncts to a hydro-electric system for protection of service in large centers of population, come in for their due share of notice. Some idea of the work done by this

The report devotes space to notices of recent decisions of the United States Supreme Court in two important cases that in which franchises secured under the authority of the State Constitution prior to its amendment in October, 1911, are held to be vested property rights of perpetual duration and include the right of making all necessary extensions within such municipalities upon the terms of the original grant, and that by which water rights are held to be property.

the value of which must be considered in the fixing of rates by public authorities.

The Workman's Compensation Act, which came into effect January 1st this year, is touched upon with the following comment:

"While our experience under this law has been limited, we recognize the justness of its underlying purposes and are also of opinion that the means and methods it provides for the settlement of claims for the injury and disability of employees will not, in view of the company's liberal policy in the past, prove unduly burdensome to the company in the future, and will be more satisfactory to its employees. The Claims Department of the company, some months before the act became effective, inaugurated a "Safety First" campaign—the chief features of which, consisting of systematic inspection, the education of employees, the installation of safety devices and the elimination of avoidably hazardous construction, will be permanently retained. In connection with this campaign the company employed a prominent Eastern firm, specializing in matters of this kind, thoroughly to inspect its properties with respect to the hazards involved in its operation and received from it a most satisfactory report."

On the financial side the report shows that during the past eight years the sum of \$38,514,781 has been expended for net plant additions, i. e., the cost of such additions less value of any property replaced. Of this the sum of \$9,091,192 was expended in 1913. In the eight years since organization a total amount of \$8,931,444 has been expended for maintenance, an average of \$1,116,430 per annum, in addition to which the cost of replacements, i. e., realized depreciation, has been met from earnings.

Under the heading of "Surplus and Reserves" the report states:

"After the payment of 6% dividends on the company's preferred stock, amounting to \$600,000, and 1½% on the common stock, amounting to \$398,848, the entire balance of the year's surplus, after establishing a reserve of \$261,733 in connection with rate-suits now pending in the Federal Court, was transferred to depreciation reserve. Against this reserve was charged \$518,568 for current depreciation and an extraordinary charge of \$1,299,848 was also made to cover the

elimination from property schedules of all obsolete, abandoned and unused plants, including the value of the Auburn and Nevada power-houses and other property superseded and rendered inoperative by the new South Yuba hydro-electric development. The result of this write-off was to clear these schedules of everything except properties in actual operation, real estate and other assets of undoubted present value. The balance remaining to the credit of depreciation reserve at the close of the year was \$2,433,493. In view of the present cleared-up condition of the company's property schedules, this balance, with normal annual charges, should amply provide for losses occasioned by wasting assets.

"At December 31, 1913, after charging off all ascertained losses, the balance to credit of Insurance and Casualty Reserve was \$52,353.13 and to the credit of reserve for bad and doubtful debts was \$34,162.12."

Under the heading, "Stability of Revenues," the report has this to say:

"The public regulation of utility rates, which is engaging the attention of many state governments in an increasing degree, is not a novelty in the State of California. For thirty-five years its municipalities have possessed and have exercised this power. While it is a reassuring fact that your company during its entire history has successfully carried on its business under these conditions and is not, therefore, confronted with wholly new and untried public policies in this respect, the question whether its revenues are being derived from reasonable rates or whether its margin of profit is such that its earning power may be seriously impaired by enforced reductions in its tariffs, is one of importance to its stockholders.

"The average rate realized from all gas sold by this company in 1912 and 1913 was 88 cents per 1000 cubic feet. With the exception of one small community of about 1000 people, where, owing to special conditions, a rate of 9 cents per kilowatt hour prevails, the company has no basic or top electric rate that is higher than 8c per kilowatt hour for residence lighting or higher than 7c per kilowatt hour for commercial lighting. In some of the larger cities lighting rates are still lower and in all cases schedules are graduated to progressive reductions for increased usage. Power rates are determined by the conditions of each case, and are naturally very much lower than these lighting rates. The company's present tariffs are the result of the policy which it has consistently pursued for a number of years of giving its consumers the benefit of lower prices whenever con-

ditions warranted it, and the most satisfactory and reassuring feature of its earnings is that they are based upon such reasonable rates. Within the past two years the company has also equipped itself with, and now has at its command, such exact and detailed knowledge of the cost of its operations and of the value of its property at the service of each of the communities served by it as to justify the firm belief of your management that the earning power of the company cannot be justly impaired by any revision of its schedules but that, on the contrary, the very large additional in-

tribute its quota to the future growth of revenues, the stabilizing influence of the smaller unit business, which is not materially affected by adverse business conditions and may be depended upon for steady growth and increasing returns under any and all conditions, is a factor of undoubted importance."

Under the heading, "Earnings and Expenses," the following condensed comprehensive statement of earnings and expenses for the years 1912 and 1913 is given:

	1913	1912	INCREASE
GROSS EARNINGS.....	\$15,869,005.99	\$14,473,525.57	\$1,395,480.42
DEDUCT:			
Maintenance, Operating Expenses, Taxes and Reserves for Uncollectible Accounts, etc	9,331,206.57	8,431,561.17	899,645.40
NET EARNINGS FROM OPERATIONS...	\$ 6,537,799.42	\$ 6,041,964.40	\$ 495,835.02
ADD:			
Profit on Merchandise Sales and Miscellaneous Income	333,331.38	271,126.39	62,204.99
TOTAL NET INCOME.....	\$ 6,871,130.80	\$ 6,313,090.79	\$ 558,040.01
DEDUCT:			
Interest on Funded and Floating Debt..	3,902,045.00	3,568,943.53	333,101.47
BALANCE..	\$ 2,969,085.80	\$ 2,744,147.26	\$ 224,938.54

vestments made within recent years, from which no adequate return has yet been realized, entitle it to and will bring to it a large increase in present earnings.

"The company's gross operating revenue in 1913 was \$15,869,006. This revenue was derived from 349,417 consumers, or at the average annual rate of \$45.40 per consumer. It is obvious that the company's earning power rests upon a broad foundation and is not dependent for its stability upon the custom of any single industry or group of consumers. There

Then follows a table showing that the net earnings of the company, after bond interest, have aggregated \$21,781,471 in eight years since its organization, of which total but 21 per cent, or \$4,622,103, was paid out in cash dividends and the remaining 79 per cent, or \$17,159,368, is reinvested in the property, applied in the reduction of funded debt, or expended for other corporate purposes:

YEAR	GROSS REVENUE	MAINTENANCE, OPERATING EXPENSES, AND RESERVES	TAXES	NET EARNINGS	INTEREST	BALANCE
1906	\$ 8,947,162	\$ 4,139,233	\$ 283,886	\$ 4,524,043	\$ 2,784,008	\$ 1,739,135
1907	11,324,140	5,378,967	217,262	5,115,911	2,854,264	2,261,647
1908	12,457,305	6,517,930	274,789	5,864,586	3,021,722	2,842,864
1909	13,191,288	7,211,517	320,059	5,959,712	2,988,522	2,971,190
1910	14,044,596	7,538,461	382,880	6,123,255	3,006,256	3,116,999
1911	14,604,609	7,697,370	516,702	6,390,537	3,254,133	3,136,404
1912	14,744,651	7,808,592	622,969	6,313,090	3,568,943	2,744,147
1913	16,202,337	8,655,044	676,163	6,871,130	3,902,045	2,969,085
Totals	8106,034,088	435,547,114	83,324,710	\$47,162,264	\$25,380,793	\$21,781,471

has also been a gradual decline within recent years in the average annual gross return per consumer. This is indicative of the comparatively more rapid increase and growing preponderance on the company's books of the smaller users of its products. While the company's larger unit business is showing very satisfactory increases and will continue to con-

The report of Price, Waterhouse and Company, the auditors called in to examine the accounts for 1913, is given; also, balance sheet showing the company's assets and liabilities.

As before stated, it is the most comprehensive report of its kind on record.

“Pacific Service” Plan for Permanent Financing

THE Pacific Gas and Electric Company's promised plan for a permanent form of financing was made public June 3d in a letter addressed by President F. G. Drum to the stockholders.

Briefly, the plan calls for a reduction of the authorized issue of common stock from \$150,000,000 to \$100,000,000, and for the creation of a new issue of first preferred stock of the authorized amount of \$50,000,000, of which \$12,500,000 is to be issued at once. Both common and preferred stockholders will have the right to subscribe to the new preferred to the extent of 30 per cent of their present holdings, the subscription price being 82½¢, payable in installments running to October 1, 1915.

Since its announcement, the plan has been very favorably commented upon by the press of the country, and the strength of the stock market immediately following the publication of Mr. Drum's letter would indicate that the plan has found general favor, particularly among the larger stockholders and others most deeply interested in the company's welfare. We reproduce herewith Mr. Drum's letter in full:

PACIFIC GAS AND ELECTRIC COMPANY

San Francisco, Cal., June 3, 1914.

TO THE STOCKHOLDERS:

Herewith please find copy of proposed amendment of the Company's articles of incorporation, to which you are respectfully requested to give your assent, by **signing and returning to Mr. D. H. Foote, Secretary, No. 445 Sutter Street, San Francisco, California, at your earliest convenience, the accompanying form of "consent and proxy"** in the enclosed stamped and addressed envelope.

This amendment is the result of many months careful deliberation on the part of your management and is being submitted to the stockholders at this time pursuant to an order of the Railroad Commission of the State of California, requiring the Company to present to it, at an early date, a plan for the payment of existing short term obligations and for meeting, in a broad and comprehensive way, the future capital needs of the Company. The effect of its adoption will be to re-classify (without increase) the Company's present maximum authorized share capital, as follows:

COMMON STOCK	\$100,000,000
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There will be no change in the form or outstanding amount of this issue, the only effect of the amendment being to decrease the authorized maximum by \$50,000,000.

FIRST PREFERRED STOCK (NEW ISSUE)	50,000,000
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This is the new class of stock authorized by the amendment in substitution for a like amount of unissued common stock. It is to be issued as fully paid with the express covenant of the Company that it shall not be subject to assessment for any purpose; shall bear 6% cumulative dividends (payable quarterly) and shall have precedence over the present preferred and common stocks with respect to dividends and in any distribution of assets. Present and future issues of this stock can be made only with the authority of the Railroad Commission of the State of California and then only for the acquisition of new property, extensions, additions, betterments and the refunding of existing obligations, as provided in the Public Utilities Act of California. It is tax-exempt in the State of California and the dividends payable thereon are not subject to the normal income tax under the Federal Income Tax Law.

PREFERRED STOCK (PRESENT ISSUE)	10,000,000
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The amendment authorizes the exchange, after July 1, 1916, of the present preferred stock for the new First Preferred stock at the rate of 1.025 shares of the new stock for each share of the old.

TOTAL AUTHORIZED STOCK CAPITALIZATION, AS AMENDED (SAME AS AT PRESENT)	\$160,000,000
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NECESSITY FOR MORE COMPREHENSIVE PLAN OF FINANCING.

The recently issued annual report for the year 1913 clearly sets forth the tremendous growth of the Company's business within recent years. The following figures from this report have the convincing force of concrete facts:

Gross Revenue in 1906	\$ 8,947,162
Gross Revenue in 1913	16,202,337
Increase in seven years	\$ 7,255,175
Average annual increase	1,036,453
Increase last year (1913)	1,457,686

Intimate knowledge of conditions in the Company's business field justifies us in predicting for the future a still more rapid growth. Additional capital investments, commensurate with such growth, will necessarily have to be made. The present plan of capitalization limits the practicable means of raising new capital to the Company's General and Refunding 5% Bonds, and the major portion of new capital required within recent years has been obtained in this way. This policy has obvious economic limitations and has also made it necessary in the past to reinvest in the property an undue proportion of the earnings, thereby diverting from the holders of the Common Stock a substantial portion of the profits of the business to which they were legitimately entitled and which, under the composite plan of bond and stock financing herein proposed, will be available for distribution to them.

The Railroad Commission of the State of California has also indicated quite clearly to the public utilities of the state that it views with disfavor the practice of raising new capital entirely from the sale of bonds. Your management is, therefore, of opinion that it will best conserve the future welfare of the Company, will bring its fiscal policy in harmony with the views of the Railroad Commission, and will be of decided advantage to the stockholders individually, if there be placed at its command, in sufficient amount to meet the Company's needs over a series of years, a high grade investment stock, such as that authorized by the proposed amendment, as an auxiliary means of financing capital expenditures.

The consummation of the plan herein outlined will give the Company the following choice of securities for financing future acquisitions, additions, extensions, betterments and refundings, subject, of course, to the jurisdiction of the Railroad Commission and issuable only in conformity with its orders:

GENERAL AND REFUNDING 5% BONDS—A public utility bond of the best character, the present investment status of which will be greatly improved by the investment in the property of the proceeds of the new issue of preferred stock herein offered and of a fair proportion of additional stock money in future additions, etc. This will enable the Company to obtain more readily and upon better terms than heretofore such construction funds as it may desire to secure through the sale of these bonds, thus diminishing the item of bond discount as a charge against revenues.

FIRST PREFERRED 6% STOCK—A high grade investment stock amply secured by assets and earnings, and issuable only with the approval of the Railroad Commission of California for the acquisition of new property, for extensions, additions and improvements and for the refunding of bonds or other obligations.

COMMON STOCK—A stock which should reach an assured investment plane and become an increasingly valuable medium of junior financing.

PRESENT NEEDS OF COMPANY

Our stockholders are undoubtedly familiar with recent conditions in the securities markets which have rendered it exceedingly difficult for even the soundest and most prosperous enterprises to secure new capital in large amounts at reasonable rates through the sale of bonds. Your Company's experience in this respect, notwithstanding its constantly enlarging business and growing profits, has been no different from that of other corporations, and since March, 1913, it has been compelled to carry on the largest and most important construction program in its history entirely from earnings and from the proceeds of money secured on short term notes. This condition is reflected in the Company's balance sheet in the item of "Uncapitalized Advances to Construction Account" amounting to \$11,586,661.78 at April 30, 1914. Short term notes are an admittedly costly and unsatisfactory form of financing and the diversion of earnings for plant additions affords little satisfaction to the stockholders who are thereby deprived of dividends, but the unquestioned necessity of completing the new hydro-electric plants on the South Yuba and Bear rivers and of making other extensions and additions to meet the growing demand for the Company's products, left no desirable alternative under the plan of financing which is now proposed to improve. The increase during 1913 of \$1,457,685

in the Company's gross income and of \$558,040 in its net income is the initial evidence of the wisdom of the course pursued by your management. Current returns indicate a saving in operating expenses of at least \$400,000 from the operation of the new Drum power-house during 1914, and we feel assured that this development will prove one of the most profitable investments the Company has ever made.

While these results amply justify the course pursued, provision must now be made for the payment of \$7,000,000 of one-year notes maturing March 25, 1915, and of certain other obligations aggregating about \$1,000,000. It is proposed to accomplish this by the issuance and sale to the stockholders, upon the terms and conditions hereinafter described, of \$12,500,000 of the new First Preferred 6% Stock at a price which will yield to the Company's treasury approximately \$10,300,000 in cash. This amount will be sufficient to pay the entire floating debt, and with other assets accruing on account of past construction, will give the Company a net working capital in excess of \$3,000,000 and place its treasury in the strongest position it has occupied since organization.

ASSETS AND EARNINGS BACK OF NEW STOCK.

The merits of a security for investment purposes rest primarily upon property value and upon demonstrated sufficiency and stability of earnings. Measured by these standards the new preferred stock is worthy of the confidence of the most discriminating investor. The appraised value of the Company's properties is substantially in excess of the combined par value of all of its outstanding bonds, of the new preferred stock to be issued and of the present preferred stock. The continuance of a safe and conservative relation of property values to additional issues of preferred stock is assured under the California Public Utilities Act as administered by the Railroad Commission. As shown in the table below, covering a period of five years, the revenues of the Company have increased steadily and have been largely in excess of aggregate dividend requirements on the new preferred issue and on the present preferred stock. Annual dividends on the new issue of \$12,500,000 Preferred Stock will amount to \$750,000. As the payment of the Company's floating debt will, however, reduce annual interest charges by about \$400,000, and as the money remaining from the proceeds of the stock sale, after the payment of this debt, will be profitably employed, the additional dividend charges against revenues and ahead of the present preferred and common stocks will be negligible.

It will be noted from the statement below that during the year ended April 30, 1914, net earnings after bond interest and discount, were four and a half times the amount necessary to pay the annual dividends on the new preferred issue and during the fiscal year 1914 such earnings will undoubtedly exceed five times the annual dividends on the new stock. Based upon the increase in business during the first four months of 1914, and upon other known factors, the Company's net revenues, after bond interest and discount, should reach, and will probably exceed, \$3,800,000 during the fiscal year 1914. In making this estimate, which we believe to be conservative, all earnings in litigation have been omitted from our calculation.

EARNINGS, ETC., FIVE YEARS ENDING APRIL 30, 1914.

Year Ending April 30	Gross Revenue	Net Revenue	* Net Revenue after Bond Interest and Discount	Annual Dividends on new Preferred Stock	Balance	Annual Dividends on Present Preferred	Balance for Common Stock and Depreciation Reserve
1910	\$13,816,904	\$6,011,442	\$3,028,644	\$750,000	\$2,278,644	\$600,000	\$1,678,644
1911	14,266,232	6,225,993	3,173,726	750,000	2,423,726	600,000	1,823,726
1912	14,546,775	6,323,500	2,902,729	750,000	2,152,729	600,000	1,552,729
1913	15,179,189	6,409,551	2,610,536	750,000	1,860,536	600,000	1,260,536
1914	16,556,673	7,336,294	3,361,782	750,000	2,611,782	600,000	2,011,782

*Excluding charges account floating debt, as this debt will be paid from proceeds of new stock issued.

BENEFITS TO HOLDERS OF PRESENT PREFERRED STOCK.

In addition to the right to subscribe to the new preferred stock upon advantageous terms, there are other obvious advantages to the present owners of preferred stock in the plan herein proposed. As the existing floating indebtedness precedes their equity, it is a menace until paid and is subject to the application of statutory remedies against stockholders. If, as has been suggested to your management, this debt were paid by means of a junior bond issue, it would place ahead of the present preferred stock a foreclosureable, interest bearing obligation. The plan herein proposed avoids this and extends to the holders of the present preferred stock the right, after two years, of exchanging it for the new preferred stock and of sharing the latter's advantageous position. At the close of two years they will have the right to exchange their present stock for the new stock at the rate of ten (10) shares of the old stock for ten and a quarter (10 $\frac{1}{4}$) shares of the new. This additional exchange value, at the

present offering price of the new stock, is equivalent to \$20.60 on each ten shares. This amount, added to the regular dividends, is equivalent to a 7% return per annum on the par value of the old stock during the interim pending exchange.

ADVANTAGES TO COMMON STOCK HOLDERS.

At no time since the organization of the Company have the earnings been as large as at present and as firmly established upon the principle of a large volume of business at a reasonable profit commensurate with the value of the property employed. While present earnings and the excellent prospects for the future amply justify the resumption of dividends on the Common Stock, the extinguishment of the present floating debt must necessarily precede the initiation of such dividend payments and, for reasons already stated, it is also highly desirable to the assured continuance of such payments that some means be provided, in addition to the bonds available under the Company's General and Refunding Mortgage, of partly financing future capital requirements by means of a high-grade investment stock, as herein proposed. Contingent upon the new stock being subscribed for, your Board is prepared to resume dividends on the Common Stock on a permanent basis at the beginning of the year 1915 at the minimum rate of 1% quarterly. While it is probable that a higher rate can be paid, it is our desire to be conservative in naming this as the minimum disbursement. Aside from the special interest which the holders of the Common Stock have in the successful consummation of this plan, the subscription rights to the new preferred stock should be profitable, particularly as this stock is being offered directly to stockholders at a saving of at least \$5 per share in underwriting commissions.

OFFERING TO STOCKHOLDERS.

Subject to the adoption of the amendment proposed herein and to the approval of the Railroad Commission of the State of California of application pending before it, your Board of Directors, by a resolution duly adopted this date, has authorized the tender to the stockholders (subject to the above conditions) of the right to subscribe for and purchase at the rate of \$82.50 per share, 125,000 shares of the new First Preferred Stock in the proportion of approximately 30% of their holdings of all existing stock, both common and preferred, as the same appear of record on the books of the Company at the close of business this date (no subscription to be received for less than one whole share and such apportionment to be made by the officers of the Company as will avoid the issuance of fractional shares).

Subscriptions must be received on or before July 15, 1914, and may be paid in installments as follows:

\$ 5.00 per share, on or before July 15, 1914 (with subscription)					
15.00	"	"	"	"	Aug. 15, 1914
12.50	"	"	"	"	Oct. 1, 1914
12.50	"	"	"	"	Jan. 1, 1915
12.50	"	"	"	"	Apr. 1, 1915
12.50	"	"	"	"	July 1, 1915
12.50	"	"	"	"	Oct. 1, 1915

Interest at the rate of 6% per annum will be paid by the Company on all installments from the time they are received at the Company's office until fully paid dividend-bearing certificates have been issued. Subscribers are given the privilege of paying any one or more of the unmatured installments at any time. Upon the payment of all installments, whether before or at maturity, a full-paid certificate of stock will be issued on the first day of the next succeeding dividend period after such full payment. Such certificates will bear dividends at the rate of 6% per annum on the par value of the stock from the date of their issuance.

Stockholders may increase their subscriptions, upon the same terms, beyond the amount allotted, in order to absorb any portion of the total offering not taken by the regular subscriptions. If these additional subscriptions exceed the number of shares available, such available shares will be allotted among such subscribers in proportion to the additional amount subscribed for by each respectively, eliminating fractional parts of shares. If by August 15, 1914, the Company shall not have received subscriptions for, or otherwise disposed of at least 70% of the stock herein offered, the amounts paid on all subscriptions will be returned not later than September 1, 1914, with interest at the rate of 6% per annum from the date received by the Company to the date when checks for the return thereof shall be mailed.

The new stock will be tax-exempt in the State of California and the income therefrom will not be subject to the normal tax under the Federal Income Tax Law. At the price of \$82.50 per share this stock yields 7.27% per annum on the investment.

A form of subscription, on which has been noted the number of shares of the new stock allotted to you, is enclosed herewith. The subscription right is, however, transferable.

It is desirable that this transaction be closed at the earliest date possible and your Directors will appreciate the immediate return of the proxy and your prompt attention to the subscription.

FOR THE BOARD OF DIRECTORS.

F. G. Drum, President.

Items From Women of the Company

This section of PACIFIC SERVICE MAGAZINE is open to any of our women employees who may desire to contribute notes on persons and events. The following have accepted appointment as contributing editors: Miss Letitia A. Curtis, Engineering Department, Hydro-Electric Section; Miss Bertha J. Dale, Auditing Department, San Francisco District.—Editor PACIFIC SERVICE MAGAZINE.

A delightful evening was spent Wednesday, May 27th, when an aluminum shower was given to Miss Alice Strycker at her home, 1907 Baker Street, San Francisco, to celebrate her approaching marriage. It was a complete surprise to the recipient and fully enjoyed. Those present were:

Misses Tess Ryan, Emma Ehlinger, Letitia Curtis and Alice Strycker from the Engineering Department, Miss Queenie Derry of the Publicity Department, Misses Hazel Moulthrop and Grace Brandt of the Land Department, Misses Rosa Lamont and Ruth Blewett of the Drafting Department, Misses Loretta Van der White and Frances Downs of the Distribution Department, Misses Emily Loewenguth and Effie Brandt of the General Manager's office, and Mrs. Lawrence B. Morton, formerly with the company.

Miss Elizabeth Gleeson of the San Francisco District was hostess at a miscellaneous shower given at her home on the evening of May 7th in honor of Miss Florence Kertell, whose engagement to Mr. J. Clarke Benson was announced a short time ago.

The color scheme for the decorations was pale pink and the table was daintily covered with sprays of roses and sweet-peas, interspersed with tiny pink candles. A large doll dressed as a bride, whose hands were linked with tiny dolls dressed as bridesmaids at each place by tiny streamers of ribbon, adorned the center of the table.

A delicious repast was served, and there was dancing and music until a late hour. Miss Kertell was the recipient of many lovely gifts.

Those present were: Misses Florence

Kertell, Lillie Kertell, Laura Gleeson, Loretta Van der White, Phoebe Willcox, Thelma Gleeson, Mazie Hurley, Edith Gleeson, Elizabeth Casey, Margaret Murphy, Aileen Buckley, Lotta Kasten, Sarah Ober, Florence MacDonald, Bertie Dale, Mazie Thompson, Marian Benson, Elizabeth Gleeson, Mrs. F. C. Blumberg, Mrs. Neal Murphy, Mrs. C. V. Gallagher, Mrs. Roy Murray, Mrs. Wm. Blyme.

On Saturday, May 16th, a number of the Sacramento District employees took the 1.15 p.m. train to the University Farm at Davis where the annual picnic was being held. The afternoon was spent visiting the points of interest on the farm, and after a picnic supper on the lawn the party all enjoyed the dance given in the large new dining-room, and then caught the 11.40 train for Sacramento. Those who enjoyed the good time were: Mr. and Mrs. C. R. Gill, Mr. and Mrs. C. W. Griffith; from the Sacramento District office force: Misses Mamie Genis, Lucile Chauvet, Cecile Chauvet, Harriet Logan, Gertrude Meyer, Ethel Battelle, Albert Olson, Hilda Hammack, former telephone operator Helen Anderson, and Mr. R. Gilbert.

The young ladies tried to persuade "Beal" Henderson of the Gas Engineering Department, who happened to be on the train, to umpire their big baseball game, but he declined with thanks, as he was afraid they had not enough lunch to satisfy his enormous appetite.

The marriage of Mr. John H. Souter, of the Bill Department, Oakland District, and Miss Cecile Maria Lavorel took place May 18th. After a short honeymoon spent in the southern part of the State,

Mr. and Mrs. Souther have returned and are now residing in their new bungalow on Cottage Avenue, where they are receiving the congratulations of their many friends.

News comes from Santa Rosa of the approaching marriage of Roy E. Daniels, a member of "Pacific Service" in the Santa Rosa District, and Miss Rosa Davaz, a young lady who has resided in the beautiful Sonoma County town for a number of years and is very popular in society there.

Manager M. G. Hall writes that Roy Daniels is a young man who has been with the company a number of years, beginning at the bottom of the ladder

and working his way up by conscientious and loyal attention to duty. "The manager and all employees of the Santa Rosa District wish the young man all the good things of life," writes Manager Hall.

Miss Stella Anderson, of the Accounting Department of the Sacramento office, is spending a week with relatives near Auburn.

On Wednesday evening, June 3d, a farewell dinner was tendered Miss Frances Downs, who severs her connection with the company on the 15th of this month. After a tour of six weeks in the southern part of the state, Miss Downs will leave for her home in Spokane.



"Pacific Service" Section, N. E. L. A.

For the information of our general readers and prospective members, we publish the following excerpt from our Secretary's letter of May 25, 1914, written to the members of the "Pacific Service" Section:

"Please be advised that at the regular monthly meeting of the Company Section held on Wednesday evening, the 20th inst., the following members of the section were elected to serve as officers for the fiscal year 1914-1915, viz.:

Chairman.....	S. V. WALTON....	San Francisco
Vice-Chairman.....	F. H. VARNEY....	San Francisco
Secretary and Treasurer.....	HENRY BOSTWICK.	San Francisco

EXECUTIVE COMMITTEE.

<i>Elected for Two-Year Term:</i>	<i>Elected for One-Year Term:</i>
J. D. KUSTER.... San Jose.	DON C. RAY.... Martinez
A. R. THOMPSON... San Francisco	W. S. COLEMAN... San Francisco
GEO. B. FURNISS... Oakland.	C. P. CUTTEN.... San Francisco

"It will be the aim of the new officers of the Section to leave no stone unturned toward making all meetings for the coming year of extreme interest to all employees, and by co-operation and team work we expect to become better fitted to perform the duty we owe to ourselves as well as to our company.

"Very truly yours,

"HENRY BOSTWICK,

"Secretary Pacific Service Section
National Electric Light Association."

Don't forget, Mr. Non-Member, that at the recent convention of the National Electric Light Association, held in Philadelphia in June of this year, *SAN FRANCISCO WON THE N. E. L. A. CONVENTION FOR 1915*. This is another very strong reason why you should become identified with the work of the Company Section.



The new Lake Spaulding, raised by the construction of a 225-foot



View taken from the north side of Spaulding



"The waters of a new Lake Spaulding glistened in the s



t its lower end. View taken from an eminence on the south side.



, showing water rushing over the spillway.



glit as they lapped the guard-rail on the dam's crest."

What the National Electric Light Association Is and Why You Should Become a Member

By ERNEST B. PRICE, Editor "Pacific Service" Section N. E. L. A. Bulletin

THE parent body of the National Electric Light Association is located in New York, and is the result of a desire on the part of the electrical industry to become better acquainted, and to develop and promote a broad-minded policy in furnishing up-to-date information gained by painstaking research along specialized lines; in a word, to establish a great clearing house for information pertaining to all branches of the electrical industry, so that member companies can draw on this general fund in the solution of the various problems that confront them from time to time.

The logical sequence of such a general plan, therefore, was the formation of company sections in various localities, and a glance at the accompanying map will give the reader a definite idea of the radius of action of this wonderfully progressive organization.

The "Pacific Service" section of the National Electric Light Association was

established in San Francisco in October, 1912, and has forged steadily ahead until, at the present time, we have a membership of 327; and the personnel of the officers and executive committee guarantees an active, beneficial year for 1914. Considerable confusion, however, still exists in the minds of some of the employees in relation to qualifications for membership in the company section, and many think that their interests are not allied in any way with the work of the section. For their information, then, we will state that the N. E. L. A. is not altogether a technical society but bears a far-reaching and direct relation to all branches of the central station organization in its broadest sense. The Commercial and Accounting departments are vitally interested; the Operating, Construction and Distribution departments equally so; in fact, no branch of the service can afford not to be represented at the monthly meetings. If you are still



The N. E. L. A. and its Company Sections.

in doubt, remember that if you are an employee of this company, in any department, you are eligible for membership.

The annual dues amount to \$5.00 or \$0.4166 per month—the cost of two tickets to the movies once a month.

A monthly Bulletin is sent to each member in addition to a bound copy of the convention proceedings. You cannot afford to side-step the N. E. L. A., Mr. Non-Member, because it is imperative that you reach out for every available piece of literature published on your work. Sometimes an idea contained in some stray pamphlet changes the whole course of your career, and in this day of keen competition when every management is looking for likely timber, you must draw away from the crowd, or your chances of success are very slight indeed. Thoughtful papers and discussions along all branches of the service cannot help but make you a better man, and will awaken a deeper interest in the work of your department. If, therefore, the net result of the experience of others similarly engaged as you are saves your time and directs you from some blind trail, then you are well repaid, for, assuredly, time is the essence of your contract in this life.

If you are still skeptical, glance over this cursory list of the subjects touched at last year's convention:

ACCOUNTING SECTION.

(1) Report of the Sub-Committee on Forms; (2) Accounting School and Education of Employees; (3) Accounting for Replacement of Plant Retired from Service; (4) Mechanical Office Appliances;

(5) the Relation of the Accounting Department to Other Departments of the Company.

HYDRO-ELECTRIC AND TRANSMISSION.

(1) Reports on Turbines; (2) Survey of Conditions of Protection; (3) Report of Committee on Operation of Water Power Systems; (4) Factors Producing Reliability in the Suspension Insulator; (5) Transmission Line Construction.

TECHNICAL SESSIONS.

(1) Report of the Committee on Meters; (2) Report of the Lamp Committee; (3) the Relation of the Incandescent Lamp to Lighting Service.

COMMERCIAL SESSIONS.

(1) Report of Committee on Electrical Salesman's Handbook; (2) Report on the Education of Salesmen; (3) Report on Electrical Merchandizing; (4) Report on Committee on Electricity in Rural Districts.

If you feel that you are not in some way identified with this work, rest assured it is only because your particular subject has not been touched, on account of lack of space in publishing the varied fields of work covered by this association. In closing, let us urge you to come to one of the monthly meetings and we feel sure that you will go away an enthusiastic booster for the N. E. L. A.

The company is lending its support to the movement by defraying the incidental expenses, such as hall rent, publication of literature, etc., and also stands the expenses of an annual banquet. We feel, therefore, that the employees should do their part towards the upbuilding of a strong company section.

“Pacific Service” Section Will Banquet

The annual meeting of “Pacific Service” section, N. E. L. A., will be held on the evening of Friday, June 19th, in the rooms of the Commercial Club, Merchants Exchange Building, San Francisco.

It will take the form of a banquet, at which the officers elected at the May meeting will be formally installed. An interesting program of entertainment has been arranged for the occasion.

Pacific Service Magazine

PUBLISHED IN THE INTERESTS OF ALL EMPLOYEES OF
THE PACIFIC GAS AND ELECTRIC COMPANY

JOHN A. BRITTON - - - EDITOR-IN-CHIEF
FREDERICK S. MYRTLE - - - MANAGING EDITOR
A. F. HOCKENBEAMER - - - BUSINESS MANAGER

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at 445 Sutter Street, San Francisco

The Pacific Gas and Electric Company desires to serve its patrons in the best possible manner. Any consumer not satisfied with his service will confer a favor upon the management by taking the matter up with the district office.

VOL. VI. JUNE, 1914. No. 1

EDITORIAL

A decision of considerable importance to public utilities throughout the land is that of the New York Court of Appeals, in a recent case, in which that tribunal upheld the claim of "going value" to be recognized as a legitimate element of capital investment to be considered in valuing the properties of a public service corporation for the purpose of rate-making.

In so deciding the court reversed the finding of the Public Service Commission of the State which was adverse to making any allowance for "going value." The opinion of the Court was unanimous, and the following excerpts give the "meat" of it:

"It is now generally recognized that 'going value,' as distinct from 'good will,' is to be considered in valuing the property of a public service corporation either for the purpose of condemnation or rate-making."

"There is no logical difference between allowing 'going value' in the valuation of a plant when it is to be taken entirely by the public, and allowing the same element in valuing the same plant for rate-making purposes."

"The difficulty in determining the 'going value' will not justify disregard of it. Rate-making is difficult. But that will not justify confiscation."

"It takes time to put a new enterprise of any magnitude on its feet after the construction work has been finished. The company starts out with the 'bare bones' of the plant and by the expenditure of time, labor and money it co-ordinates those bones into an efficient working organism and acquires a paying business. The proper and reasonable cost of doing that, whether included in operating expenses or not, is as much a part of the investment of the company as the cost of the physical property."

The court goes on to define going value, for the purpose of rate-making, to be the amount equal to the deficiency of net earnings below a fair return on the actual investment due solely to the time and expenditures reasonably necessary and proper to the development of the business and property to its present stage and not comprised in the valuation of the physical property. Again quoting from the opinion:

"It may be conceded that going value has no existence apart from tangible property and that, commercially, there is but one value, that of the property as a whole, but as the rate cannot be made to depend upon the exchange value, which would, in turn, depend upon the rate, it would seem to be necessary to appraise the physical property and the going value separately; and, of course, that is the case if the cost of reproduction rule be adopted."

In its opinion the court also considered the proper method to be pursued in appraising the going value of a utility, finding the most satisfactory method to be as follows: Show the actual experience of the company, the original investment, its earnings from the start, the time actually required and expenses incurred in building up the business, all expenditures not reflected by the present condition of the physical property, the extent to which bad management or other causes prevented or depleted earnings, and any other facts bearing on the question, keeping in mind that the ulti-

mate fact to be determined is not the amount of the expenditures, but the deficiency in the fair return to the investors due to the causes under consideration.

Where the accounts of a company have not been kept in a manner to show clearly early deficits, or where the existing company has been made up by the combination of other plants and systems and the early records for this or other reasons are not available, the value of the business must be shown by other methods. The most favored method of showing the value of the existing business, where the original costs are not obtainable, is to calculate the costs of the development of a similar business by showing the losses which a comparative plant would suffer if it undertook to develop the same amount of business that the existing plant has. If consumers were taken on as fast as mains could be laid and services extended, the first few years would fail to return a sufficient amount to pay operating charges, interest and depreciation.

In an opinion rendered the other day in the case of Pacific Gas & Electric Company v. City and County of San Francisco, the Master in Chancery declared this comparative plant method to be sound, and while he allowed but a part of what the company believes to be the fair value of its developed business, he recognized the principle of making a separate and independent allowance for the developed business, in addition to the value of the physical properties, and sustained the method of showing that value.

The following, from the American Gas Light Journal, issue of May 18, 1914, we consider worthy of reproduction here:

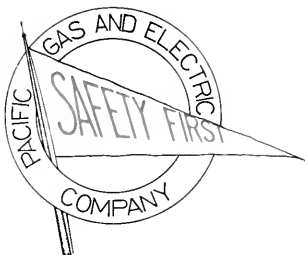
"AS A MEANS OF OBTAINING EFFICIENCY.
—At a recent conference in New York City, at which were discussed ways of selecting and training employees, one of the speakers dwell particularly upon the

obligations of the employer and the effect of his bearing and personality. He said that, 'Harmony between man and boss depends upon the proportion and nature of the positive and negative elements of character of each. An extremely positive boss will not work harmoniously with either extremely positive or extremely negative men—and conversely. As to disposition, there are several types of executives, two of which, very commonly met, may be analyzed as follows:

Positive—or driving.	Negative—or drawing.
Keen.	Mild.
Quick.	Deliberative.
Domineering.	Persuasive.
Changeable.	Constant.
Impatient.	Patient.
Opinionated.	Teachable.
Excitable.	Calm.

"The positive, driving type, if given men of his own degree of positiveness, will arouse antagonism and insubordination. The negative type, if given men of his own disposition, will fail to arouse enthusiasm and stimulate action. Give the positive boss men several degrees more negative than himself, and the negative boss men several degrees more positive than himself, and the result is harmony. Educate the boss, in addition, to apply the principles of efficiency to the job and the principle of character analysis to his men, and the problems of management are solved. This is the ideal."

With the present issue PACIFIC SERVICE MAGAZINE enters upon its sixth year. While still an infant, we think we may venture to claim for it a place in the front rank of house-journal literature, and if it is found to contribute something, however little, to the aggregate of universal progress we are glad, and we congratulate ourselves and our readers. It is all in line with the spirit of "Pacific Service."



Think "SAFETY FIRST" It Saves You Money

OF course accidents cost the employer money.

But what of the employee? What of his loss in wages, his decreased earning capacity, his lessened value to his family?

Take a workman who has lost the sight of an eye. He first stands the pain and suffering; then loses two weeks' wages under the compensation act; then loses thirty-five per cent of his wages for something like 104 weeks, or two years, provided the employer does not wish to retain him and stands on the payment of compensation at sixty-five per cent of the wage rate.

At the end of the two years the workman must place himself anew. He must do it as a one-eyed man. And for one-eyed men there is ever and always less work and less wages than for two-eyed, normal men.

What is true of the loss of an eye is true of the loss of a hand or a leg, and in a less degree even in the loss of a finger.

It is estimated by the Industrial Accident Commission that permanent disabilities—injuries like the loss of an eye or a hand or a finger—caused a wage loss to workmen in California in 1913 of over \$4,750,000. That is, it cost the workmen of California out of their own pockets over four and three-quarters millions of dollars in one year to be bruised, maimed and broken in a permanent and lasting way.

Workmen, think this over! Think it over when you pick up and use an old and mushroomed tool; think it over when you pass by open and unguarded holes and pits; think it over when you get closer than you should to unguarded machinery or to electric wires; think it over whenever your own safety and the safety of your fellow men depends upon your thinking and using your head.

Think "SAFETY FIRST."

J. P. C.

The Half-Watt Nitro Lamp

By JOSEPH P. BALOUN, Chief Draftsman

THE latest prospective rival in the illuminating field is the nitrogen gas-filled lamp with tungsten filament, whose efficiency of one-half a watt per candle-power places it superior to all previous incandescent lamps. Its high efficiency and almost perfect white light makes it a most desirable illuminant.

All of the latest German and English engineering publications are advertising the fact that the half-watt lamp has been developed in large units of from 600 to 3000 candle-power, for the purpose of illuminating extensive interiors or exteriors, public buildings and streets, plazas and parks.

It was at first believed that half-watt lamp units of only very high candle-power and low voltage could be produced this year. This would have necessitated operating a number of lights in series, but as this form of lighting is not as convenient as the ordinary multiple type we may be thankful that the development was rushed, making the latter type available.

Where weight is a factor, as both the enclosed and open types of are lamps are very heavy, with complicated magnetic feeding mechanism for the consumption of the carbons, it can be readily seen that with a 600 candle-power half-watt lamp bulb weighing but 7½ ounces, and a 3000 candle-power bulb weighing only 19¼ ounces, considerable saving of weight is assured. It is true that in these weights sockets, hangings or reflectors are not included, but yet with all this equipment there is an undoubted saving.

The accompanying photograph is of



Half-watt nitro lamp
5000 candle-power
12-inch diameter bulb

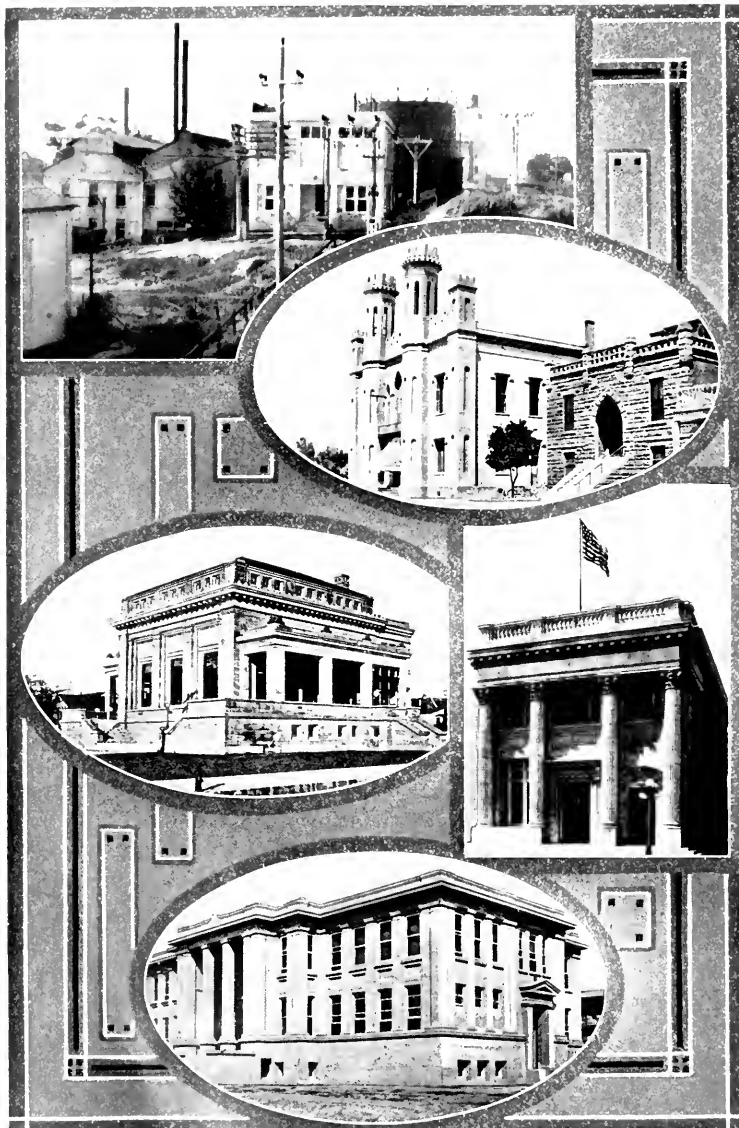
a one-half watt nitro lamp such as we have described. This especial lamp has just recently been brought to San Francisco, and represents the very latest and best in the world's advancement for a commercial 5000 candle-power lamp consuming but 2500 watts of electric current. The glass bulb is 12 inches in diameter and is shown without a reflector, etc. In appearance it resembles the ordinary incandescent lamp.

This new 1914 development of a half-watt lamp is a great advancement over the

early carbon filament lamps that consumed current at the rate of over six watts per candle-power. This new application is in great part due to the progress made in drawing tungsten into wire; for the filament is made of a closely wound coil of drawn tungsten wire of great strength. As none of the valuable characteristics of even the ordinary incandescent lamps are sacrificed, and as the average life in actual burning hours reaches practically 1000, its improvements alongside of an open or closed carbon arc lamp are multifold.

These new lamps are adaptable to all voltages, either direct or alternating and on all frequencies of current in commercial use.

But until these lamps are developed of small enough candle-power for household usage, and time has had its true test of this newcomer—the half-watt lamp—we shall not decide that the possibilities of electric lighting have been fulfilled, though being duly appreciative of the wonders that have been accomplished.



Views of Marysville. Commencing at the top and reading downward, from left to right, these show: The Pacific Gas and Electric Company's electric substation and gas-works; Court House, Marysville; Public Library; Northern California Bank of Savings; High School.

JOTTINGS FROM DISTRICTS AND DIVISIONS

A Few Items Regarding the Marysville District

By J. E. POINGDESTRE, Manager Marysville District

They say that Marysville is the hub of this part of the Sacramento Valley. It certainly is the center of a very prosperous country, taking in Yuba and Sutter counties.

Marysville in 1849 had a population of over 10,000, nearly all engaged in mining. Since then things have changed, and although mining is still an important industry, especially the large gold dredgers in operation at Hammonton and Marigold which add largely to the gold output of California, yet the Yuba County orchards are increasing rapidly and adding to the wealth of the county, more especially since the ranchers are alive to the value of irrigation and, particularly, the use of electric power, which increases greatly the yield of all agricultural products, including oranges, lemons, peaches, pears, apples, plums, grapes, berries, vegetables, almonds and walnuts.

Marysville, one of the oldest towns in the state, is improving rapidly, many new residences going up this year; and

it is increasing in population. It has three banks, modern stores, a large brewery, two bottling works, lumber yards, flour mill, fruit canning plants and the big dredger and construction shops, known as the Yuba Construction Company. Soon will be added a large door and window-guard company. Its levees are now in perfect condition, thanks to the good work done in the past by W. T. Ellis Jr., past levee commissioner. Space does not permit us to enlarge to any considerable extent upon the many advantages that Yuba County possesses, but we think it deserving of mention that the culture of rice and olives was added last year to its products, both of which demand power and will prove very profitable. Other small thriving towns are Browns Valley, Smartsville and Wheatland, all of which are supplied from "Pacific Service." The latter is a great hop-growing district.

Three miles of line extension are now being constructed in the Linda Levee District, three miles from Marysville, to sup-



Gold dredge on Yuba River near Marysville.



Navigation on Feather River at Marysville.



Peach orchard in Sutter County.



Fig orchard, Sutter County.

ply the Modern Realty Co. with power. This enterprise is opening up new territory in Yuba County for colonization.

Olives will soon be an important industry in District 10, where 20,000 young trees have been planted out for sale, the soil being particularly adapted for this product.

Yuba and Sutter counties are divided by the Feather River. Yuba City is the county seat of Sutter County and has a population of about 1600. A new approach to the Feather River bridge is about completed, and will be a great improvement to travel between Yuba City and Marysville, about one mile apart. Yuba City also is improving. It has a bank, two fruit canneries, two dried fruit establishments, a flour mill, two newspapers and a municipal water-works.

Sutter County is one great orchard—mile after mile of fruit trees, figs, grapes, peaches, prunes, apricots, cherries, almonds and walnuts. "A thing of beauty and a joy forever," with an increasing revenue for the Pacific Gas and Electric Company, for nearly every rancher nowadays has his own individual pumping-plant driven by electric power. McNeal, Libby & Co. of Sacramento give the preference to Sutter County peaches over all others for canning, and, in consequence, they command a good price and are in great demand.

Other towns supplied with electric power in this district in Sutter County, outside of Yuba County, are Nicolaus, on the southeast, where pear, prune and alfalfa predominate, together with dairy-

ing; Bogue and Oswald in the peach belt; Sutter City at the base of the Sutter Buttes, eleven miles west of Yuba City. Then, going north, we have Terra Buena, Encinal and Live Oak, all prosperous fruit-growing districts.

Sutter Basin, near Chandler, has from three to four hundred acres in rice and using "Pacific Service." It is intended later on to plant one thousand acres.

Reclamation of the entire Sutter tule basin will, before long, be an accomplished fact. This comprises over one hundred thousand acres, and when reclaimed will add still more to the wonderful products of Sutter County.

A territory still to be opened up is O'Banion Corners and Tudor, the latter being about fifteen miles southwest from Yuba City, and which is now being prospected for power and lighting. This land will in the near future be rapidly subdivided and sold in small tracts and adding its quota of wealth to Sutter County.

The Pacific Gas and Electric Company's lines in the Marysville district total one hundred and ninety miles and supply power and lighting over a wide extent of country, and which is constantly growing.

Sutter and Yuba counties have undoubtedly a great future before them.

Manager Stanley Walton of the Commercial Department sends us word of the following activities:

A contract has recently been closed

with the Sperry Flour Company for service for operating grain-handling machinery that is being installed on the wharf adjoining the big mill at South Vallejo. The mill at South Vallejo has been a landmark in that vicinity for a great many years. It was constructed a number of years ago by Mr. A. D. Starr, now deceased, and for many years was known as the Starr Mill. Power for driving machinery in the main plant is generated by steam engines, and the use of electric power from a transmission line for operating the new machinery that is being installed is typical of the progress being made by our large business firms.

The Cassidy mine, located near Nevada City, is also to be reopened after a long period of idleness. Mr. W. L. McGuire and Mr. C. H. Holbrook Jr., who are prominent mining engineers of San Francisco, are behind this proposition, and have associated with them Mr. St. John, who was formerly connected with the Sierra Mining Company, operating the Alaska mine, at Pike City. The Cassidy mine is located between the Empire and Pennsylvania shafts, both of which are famous producers, and every indication points to the fact that the Cassidy will itself, when properly developed, prove a very fine mine.

The old Murchie mine, located at Nevada City, which is of considerable historical importance, is about to be re-

opened by a group of New York financiers headed by Mr. Henry W. Miller, a well-known contractor of New York. A contract has just been entered into with these people, providing for the furnishing of water to drive the pumps that are now installed, and which within a short time will be changed over to electric drive. Mr. Miller and his associates have every reason to believe that their examination of the Murchie mine, after it is unwatered, will prove satisfactory, and that the mine will be operated on a very large scale.

A contract covering service to the Phoenix Milling Company, in Sacramento, has been renewed with us, and is of more than passing interest. The Phoenix mill was the first power consumer supplied with electric energy from a hydro-electric plant in California, so far as we know, this plant being supplied from the Folsom power-house when it was first constructed. The plant has been located at the corner of Thirteenth and J streets, in Sacramento. It is, however, now being abandoned, and machinery is being installed in a new, up-to-date, reinforced concrete building, located on Twelfth and B streets, adjoining the Southern Pacific Railroad. The present plant is modern in every respect and is quite a contrast to the old plant that is being abandoned. The Phoenix mill has been operated from the beginning by Mr. J. H. Arnold, who is a well-known resident of Sacramento.



Alfalfa and cattle ranch.



Orange grove, near Nevada City.



FIVE DOLLARS REWARD for the most appropriate motto for this library sent to the Secretary's desk by the 4th of July, 1914. Who is going to get it?

A complete set of the large edition of the International Encyclopedia, all completely bound, has just been placed on the shelves for the use of members. This set was originally bought with the remainder of the late Mr. Wise's books, but had never been removed from the home of Mrs. Wise, who has been abroad for nearly a year. It is certainly an acquisition. Call and see.

Mr. Britton's office has donated two volumes of the "Water-Power Chronicle," a monthly publication. These the library has had bound and added to its list of circulating volumes.

The office of Prof. C. L. Cory, the consulting engineer, kindly presented four complete volumes of the "Journal of Electricity, Power and Gas," which the library has bound and placed on its shelves. Many thanks, gentlemen.

The copies of "Electric Traction" given by Mr. Frank G. Baum's office have been bound and placed on the shelves.

The Westinghouse Electric and Manufacturing Company has promised to send its company magazine to our library files for the use of our members in exchange for the "Pacific Service" magazine.

It will no doubt be of interest to mention that the number of bound books on hand and filed is 480, the number of pamphlets 2259, and the number of maps 25.

P. G. & E. Tennis Tournament

Tennis players in the company are hereby notified that the fourth annual tennis tournament will be staged some time in July or August.

A committee has been formed to look after the running of this tournament, allot proper handicaps, select a court, etc.

The last tournament held in Oakland on a private court was very successful and this affair will probably be played on the same grounds.

Heretofore we have been unable to interest our out-of-town players to compete. It is the hope of our hard-working committee that we will be able to have all of our company tennis men throughout the system play and make this fourth meeting a howling success.

As the tennis trophy, a handsome silver loving cup (which has been won

twice by the Engineering Department), is a three-win cup it is up to the other departments and divisions to take warning, as another win by the Engineering Department tennis squad puts the cup in their possession. So all players who may be out of shape due to late hours, etc., are urged to get in training at once.

Participants should send their names to Mr. J. C. Steele of the Engineering Department as soon as possible, giving a record of wins, etc., in order that proper handicapping may be made possible.

Notice will be forwarded individually to all interested, giving final date, meeting place, etc.

Now all pull together and give a real Pacific Tennis Tournament on this annual gathering.

PACIFIC GAS AND ELECTRIC COMPANY

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H. P. PITTS.....Industrial Engineer
S. V. WALTON.....Manager Commercial Dept.
S. J. LISBERGER.....Engr. Electric Distribution
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C. J. WILSON.....Asst. Engr. Electric Distribution
F. H. VARNEY.....Engr. O. & M. Steam Section
F. G. BAUM.....Chief Engineer Hydro-Electric Dept.

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ALAMEDA CO.	Oakland	F. A. LEACH, JR.
BERKELEY		
OAKLAND		
CHICO	Chico	H. B. HERYFORD
COLUSA	Colusa	L. H. HARTSOCK
CONTRA COSTA	Martinez	Don C. RAY
FRESNO	Fresno	M. L. NEELY
GRASS VALLEY	Grass Valley	JOHN WERRY
MARYSVILLE	Marysville	J. E. POINGDESTRE
MARIN	San Rafael	W. H. FOSTER
NAPA	Napa	O. E. CLARK
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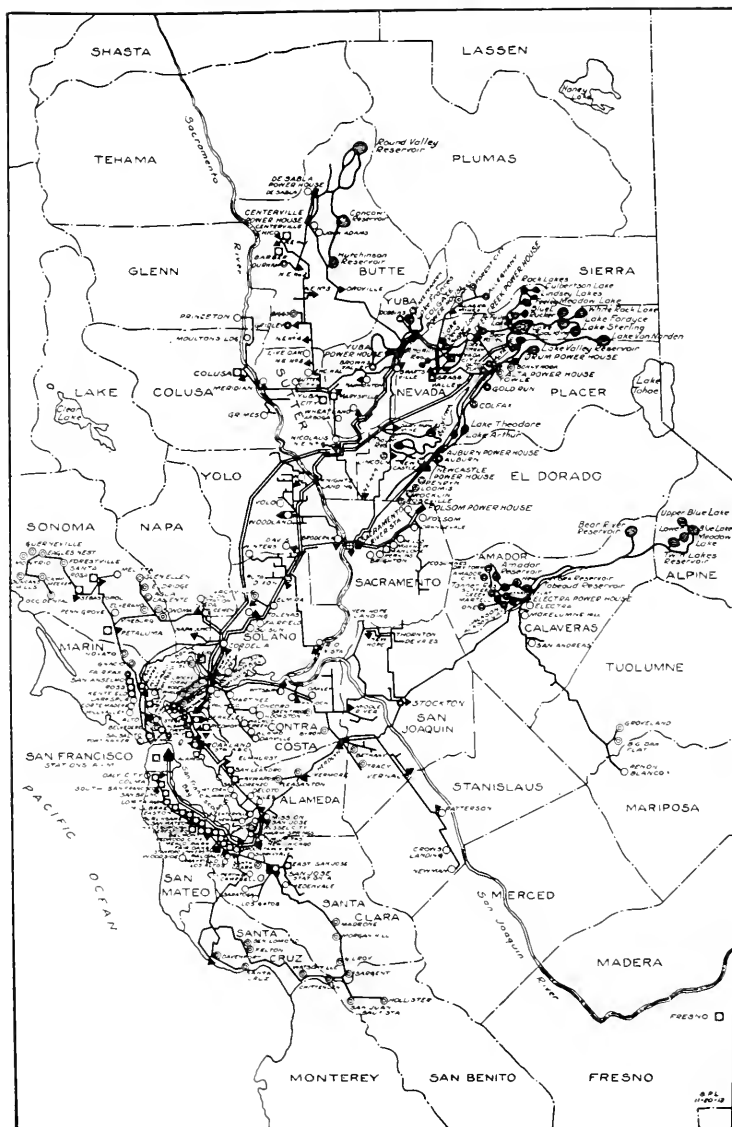
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	DIRECTLY	INDIRECTLY	TOTAL	
Electricity.....	132	62	214	1,221,123
Gas.....	49	2	51	1,124,893
Water (Domestic).....	14	14	28	58,905
Railway.....	1	...	1	75,602

Place	Population	Place	Population	Place	Population
*Alta.....	20	*Forestville.....	100	*Palo Alto.....	6,300
*Alameda.....	27,000	*Felton.....	300	*Pacheco.....	200
*Alamo.....	50	*Fresno.....	40,000	*Perry.....	250
*Albany.....	800	*Folsom.....	1,800	*Patterson.....	300
*Amador City.....	200	*Gailroy.....	2,000	*Penn Grove.....	300
*Adams John.....	25	*Glen Ellen.....	500	*Perkins.....	50
*Alleghany.....	200	*Gold Run.....	100	*Petaluma.....	5,500
*Alto.....	25	*Grass Valley.....	4,500	*Piedmont.....	1,720
*Alviso.....	200	*Gridley.....	1,800	*Pike City.....	200
*Angel Island.....	280	*Grimes.....	250	*Pinole.....	1,500
*Atherton.....	250	*Groveland.....	125	*Pittsburg.....	2,572
*Auburn.....	2,375	*Guerneville.....	500	*Pleasanton.....	2,000
*Agua Caliente.....	100	*Hammonton.....	500	*Point San Pedro.....	20
*Alvarado.....	900	*Hayward.....	4,000	*Port Costa.....	600
*Antioch.....	3,000	*Hillsborough.....	1,000	*Redwood City.....	3,200
*Arboga.....	100	*Hollister.....	3,000	*Richmond.....	10,000
*Barber.....	500	*Hookston.....	75	*Rio Vista.....	884
*Belmont.....	350	*Ignacio.....	100	*Rocklin.....	1,000
*Ben Lomond.....	800	*Ione.....	900	*Roseville.....	2,600
*Belvedere.....	1,000	*Irvington.....	1,000	*Rodeo.....	500
*Benicia.....	3,360	*Jackson Gate.....	100	*Ross.....	500
*Beresford.....	25	*Jackson.....	2,035	*Russell City.....	250
*Berkeley.....	53,000	*Kennedy Flat.....	250	*Sacramento.....	75,602
*Bethany.....	200	*Kentfield.....	250	*San Andreas.....	200
*Biggs.....	750	*Knights Landing.....	350	*San Anselmo.....	1,500
*Big Oak Flat.....	20	*Knightsen.....	125	*San Bruno.....	1,500
*Brentwood.....	200	*Lake Francis.....	125	*San Carlos.....	100
*Brighton.....	100	*Lafayette.....	100	*San Francisco.....	510,000
*Broderick.....	200	*Lathrop.....	300	*San Jose.....	37,946
*Brown's Valley.....	50	*Live Oak.....	200	*San Leandro.....	4,000
*Byron.....	200	*Livermore.....	2,250	*San Lorenzo.....	100
*Burlingame.....	4,300	*Los Gatos.....	3,000	*San Mateo.....	6,500
*California City.....	25	*Larkspur.....	600	*San Quentin.....	2,500
*Camp Meeker.....	200	*Lincoln.....	1,400	*San Rafael.....	6,000
*Campbell.....	600	*Lomita Park.....	100	*San Ramon.....	25
*Centerville.....	1,000	*Los Altos.....	500	*San Pablo.....	1,000
*Centerville.....	20	*Loomis.....	400	*Santa Clara.....	6,000
*Chico.....	13,000	*Madison.....	250	*Santa Cruz.....	10,000
*Collinsville.....	150	*Madrone.....	125	*Saratoga.....	50
*Colma.....	3,500	*Maletta.....	30	*Santa Rosa.....	10,500
*Colusa.....	1,500	*Manly.....	50	*Sebastopol.....	1,200
*Concord.....	1,500	*Martinez.....	5,000	*Sausalito.....	2,500
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*Cement.....	1,500	*Marysville.....	7,000	*Smartsville.....	500
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*Cordelia.....	150	*Mayhew.....	50	*Stanford University.....	2,600
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*Crockett.....	2,500	*Meridian.....	300	*Stege.....	1,000
*Crow's Landing.....	375	*Millbrae.....	300	*Stockton.....	35,000
*Cupertino.....	50	*Mills.....	50	*Suisun.....	1,200
*Daly City.....	250	*Milpitas.....	300	*Sutter City.....	150
*Danville.....	250	*Mill Valley.....	2,500	*Sutter Creek.....	1,500
*Davis.....	750	*Mission San Jose.....	500	*Sunnyvale.....	1,500
*Deeoto.....	350	*Mokelumne Hill.....	150	*Tiburon.....	100
*de Saba.....	25	*Monte Rio.....	50	*Torrey.....	20
*Dixon.....	1,000	*Morean Hill.....	500	*Towle.....	100
*Dobbin's.....	50	*Mountain's Landing.....	30	*Tracy.....	1,200
*Davenport.....	1,000	*Mountain View.....	2,500	*Union Station.....	40
*Drytown.....	20	*Mt. Eden.....	500	*Vacaville.....	1,200
*Durham.....	500	*Mar Island.....	500	*Vallejo.....	13,600
*Dutch Flat.....	500	*Napa.....	7,500	*Vineburg.....	200
*Duncan's Mills.....	150	*Nevada City.....	2,700	*Walnut Creek.....	1,500
*Eagle's Nest.....	50	*New Chicago.....	10	*Warm Springs.....	200
*Easton.....	300	*Newark.....	700	*Watsonville.....	1,500
*Edenvale.....	500	*Newcastle.....	750	*Wheatland.....	1,000
*Edridge.....	500	*Newman.....	1,000	*Winters.....	1,200
*Elmira.....	150	*Niles.....	800	*Woodland.....	4,200
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*Emeryville.....	5,000	*Oakland.....	215,000	*Yuba City.....	1,000
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* Gas and Electricity

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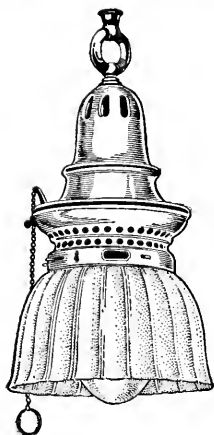
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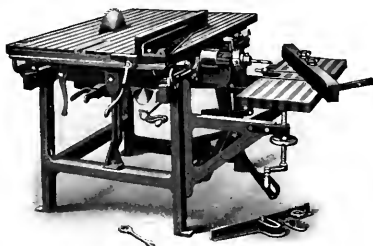
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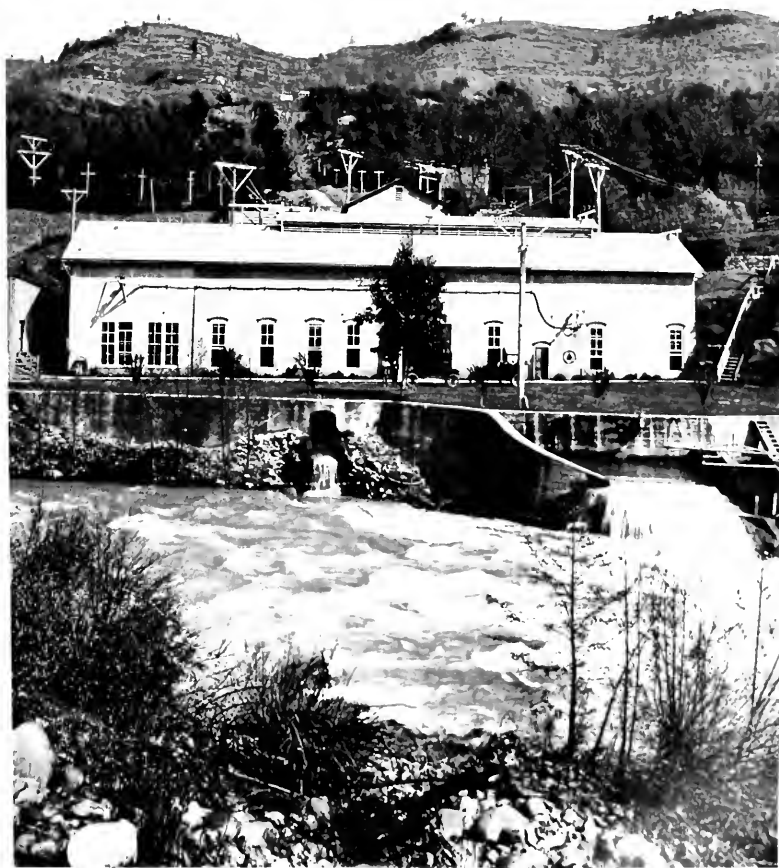
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PACIFIC SERVICE MAGAZINE



CENTRAL VALLEY POWER HOUSE, CALIFORNIA DIVISION

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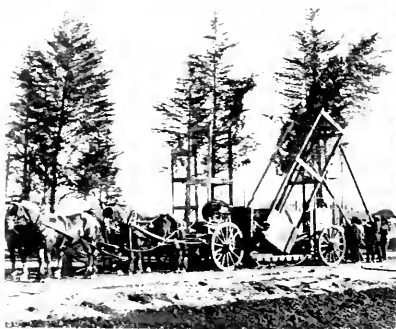
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Contents for July

LAYING OUT THE EXPOSITION GROUNDS	<i>Frontispiece</i>
GARDENING FEATURES OF THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION	<i>Donald McLaren</i> 39
THE JAMES HUGH WISE LIBRARY	<i>J. P. B.</i> 45
IRRIGATING BY MEANS OF ELECTRIC POWER IN YOLO COUNTY	<i>W. E. Osborn</i> . 46
QUERY: IS THE SIR JOSEPH HOOKER OAK THE LARGEST IN THE WORLD? DISCUSSED BY	<i>Prof. W. A. Schell, U. C.</i> . 48
"PACIFIC SERVICE" PLAN FOR PERMANENT FINANCING MEETS GENERAL APPROVAL	50
TIDINGS FROM DISTRICTS AND DIVISIONS	53
A WARNING TO VOTERS OF CALIFORNIA—PROPOSED PROHIBITION AND EIGHT-HOUR LAWS ARE VICIOUS MEASURES WHICH EVERY LOYAL CALIFORNIAN SHOULD HELP TO DEFEAT	<i>John A. Britton</i> 62
EDITORIAL	64
"SAFETY FIRST"—"FIRES LAST"	<i>R. J. C.</i> 66
OUR "PACIFIC SERVICE" SECTION, N. E. L. A., BULLETIN	<i>E. B. Price</i> . 68
ITEMS FROM WOMEN OF THE COMPANY	70
DIRECTORY OF COMPANY'S OFFICIALS	i
MAP OF COMPANY'S SYSTEM	ii
CITIES AND TOWNS SUPPLIED BY "PACIFIC SERVICE"	iii

Index to Advertisers

Allis Chalmers Mfg. Co.	vi	Pierson, Roeding & Co.	viii
Associated Oil Co.	x	Remington Typewriter Co.	xii
Byron Jackson Iron Works.	ix	Roebbing's, John A., Sons Co.	xii
Chaplin-Fulton Mfg. Co.	ix	Schaw-Batcher Co.	x
General Electric Co.	xi	Springue Meter Co.	x
General Gas Light Co.	ix	Standard Underground Cable Co.	ix
Halsey, N. W., & Co.	iv	Steiger & Kerr Stove & Foundry Co.	xiii
Harron, Rickard & McGone.	iv	Western Engineering Publishing Co.	x
Johns-Manville, H. W., Co.	xvii	Westinghouse Electric & Mfg. Co.	3d page cover
Mark-Lilly Co.	xii	White, J. G., Engineering Corporation	2d page cover
Pacific Telephone & Telegraph Co.	2d page cover	Wood, R. D., & Co.	xiii
Pattick & Co.	x		
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LAYING OUT THE EXPOSITION GROUNDS.

Moving *acacia latifolia* on island in Fine Arts lagoon. Lagoon in course of planting. Unloading specimen cypress at Exposition grounds. Planting large Monterey cypress.

Gardening Features of the Panama-Pacific International Exposition

By DONALD McLAREN, Acting Chief of the Department of Horticulture, P. P. I. E.

The name of McLaren needs no introduction to the people of California. It is a name to conjure with wherever the language of flowers is spoken. Golden Gate Park in San Francisco today bears tribute to the genius of John of that ilk, and the gardening display at the Panama-Pacific Exposition will surely add to his fame. The active charge of this work John McLaren has placed in the hands of his son, Donald, who has written expressly for PACIFIC SERVICE MAGAZINE the following article which we venture to think will prove most interesting reading.—EDITOR PACIFIC SERVICE MAGAZINE.

THE Panama-Pacific International Exposition opening, as it does, on February 20, 1915, and closing on December 4th of that year, presents a problem in planting which the landscape engineers of no other international exposition have had to meet. The opening occurs in midwinter and the doors of the Exposition will likewise close in midwinter, thereby necessitating the use of evergreen trees and shrubs throughout. It will naturally also be expected that there shall be a blaze of color at the opening as well as at the close. Happily, on account of our beautiful and mild winters, we are able to create these effects.

In this connection it is interesting to note that all the areas to be planted were originally composed of drifting sands, or sands which had been pumped in from the bay, upon which no ornamental plants of any character whatsoever could exist. To overcome this difficulty it has been necessary to cover the entire planting areas with good surface soil in order to maintain lawns, trees and plants.

The uniform height of the buildings from the ground to the cornices being sixty feet, it has, therefore, been found necessary to use extremely large trees, banked up against the buildings, in order

to create any effect whatsoever. These plants consist chiefly of cypress and eucalyptus, varying in height from 30 to 50 feet, all of which have been obtained from Golden Gate Park and from the Presidio reservation. Approximately 500 plants of this size were side-boxed a year ago, and are now being moved into their permanent positions. This lot of plants is undoubtedly the largest collection of evergreen trees which has ever been moved in connection with any landscape work.

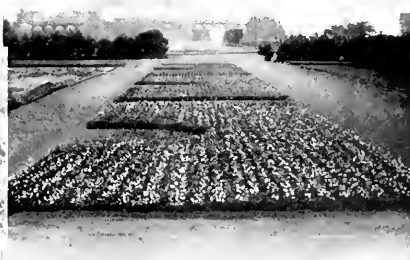
On account of the varied conditions prevailing in the various portions of the grounds of the Exposition there will be abundant opportunity for the use of many classes of plants, some of the situations being bleak and exposed, while others are perfectly sheltered and protected. In fact, in some of the southern exposures of the inner courts there will be used a high class of semi-tropical plants, such as palms, bananas, tree ferns, weigandias, etc.

Three main avenues are to be made features of, all the planting consisting of large specimen trees and palms. For instance, the planting of the east driveway between Machinery Hall and the Varied Industries and Mines building will be made up of groups of individual speci-



mens of *Dracaena indivisa*, all well branched plants of an average height of twenty feet. These plants have all been planted in their permanent positions.

These great buildings are clothed with Monterey cypress banked up with Lawson cypress and *Thuja gigantea*, in front of which have been planted specimen plants of various firs and spruces, while individual specimens of Span-



Palms along south drive ready to be planted. Flower beds in south garden. Australian tree ferns. Nursery in Tennessee Hollow, Presidio.

ish fir, or abies pinsapo, have been set out between them and the *Dracaena* avenue. It is planned to maintain a magnificent blaze of color in front of the firs and spruces by the use of first azaleas hinodogiri, a bright red azalea of Japan, which will be in bloom at the time of the opening of the Exposition. This will be followed by a bank of hybrid rhododendrons from Europe, among which will be planted Japanese lilies of various sorts. After this show is over it will be followed by plantings of *hydrangea hortensis*, the pink *hydrangea*, which will maintain a show until the closing of the Exposition.

The South driveway will be planted specimen plants of *Phoenix Canariensis*, or Canary Island date palm, alternately spaced every thirty feet by *Washingtonia robusta*, or California fan palm, plants all averaging from 18 to 25 feet in height. There will be a double row of these on either side of this driveway, which is half a mile long. The trunks of the date palms will be planted with hardy ferns, which will be placed in the crotches of the old leaves and interspersed with color, for which purpose ivy leaf geraniums, *mesembryanthemum*, etc., are to be used. Passion vines will also be planted at the base of the palms to climb up the trunks and out over the leaves. These vines, with their brilliant flowers, will droop from the ends of the leaves and form a festoon effect. Between the palms, *hydrangeas* and *marguerites* specimens four feet in diameter will be placed in tubs, the groundwork to consist of lawn.

Against the south fronts of the buildings, facing on the South driveway, will be planted specimen plants of *eucalyptus globulus*, or our common bluegum, 40 to 50 feet in height and banked up with other smaller growing varieties of *eucalyptus*, such as *eucalyptus robusta*, *viminialis*, *leucoxydon*, etc., while in front of these will be placed banks of our yellow flowering acacias, such as *acacia floribunda*, *latifolia*, *Baileyana*, etc. In front of these again it is the intention to main-

tain a magnificent flowering effect, for which it is aimed to use first of all spring flowering shrubs and pansies, to be followed by flowering perennials and afterward dahlias.

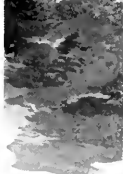
The West driveway will be lined with *eucalyptus* as a street tree and the faces of the buildings banked up with large specimen plants of *eucalyptus globulus*, finished off with other varieties of *eucalyptus* as in the South driveway, in front of which will be placed *escallonias*, *pitiosporum*, *euonymus* in variety, etc., it being necessary to use hardy plants on account of the exposure of this situation to our harsh climatic conditions.

The North driveway, fronting on the north gardens and providing as it does magnificent views of the bay and the adjacent hills of Marin and Alameda counties, will not be lined with any avenue trees. The plantings against the buildings will consist of Monterey cypress 40 to 50 feet in height and banked up with smaller specimens of the same variety, together with hardy species of acacias.

The plantings in the North gardens, on account of the exposed situation and because of the magnificent views obtainable from and across them, will consist of simple lawns interspersed with shapely groups of low-growing hardy evergreen shrubs.

The treatment of the Fine Arts lake will be confined to the natural. Practically all of this planting has been completed, with the exception of the immediate planting around the building, and consists of natural groups of evergreen shrubs placed on the small promontories and inlets of the lake. In addition to the large trees and shrubs which have been set around the borders of the lake, 10,000 *Vinea major* or periwinkle have already been planted, and interspersed among the shrubbery have already been set out 5000 violets, the violets being placed where their odor will be appreciated and enjoyed by all visiting this portion of the grounds.

North of the Fine Arts lake will be provided a simple little garden finished with



quiet little nooks and resting places, which should be a source of enjoyment to all visiting this vicinity.

The South gardens, embracing the entire territory between the Horticultural building and Festival Hall, will be maintained as a French garden, containing three large pools and ornamented with numerous small fountains, balustrades and beds of color. All of these beds will be planted in one color, for instance, at the opening of the Exposition the entire area of beds will be a blaze of yellow daffodils, with a ground work of yellow pansies to be followed by red tulips, after which a planting of begonia *erfordi* will be made which will carry the color scheme through until the close of the Exposition. Each planting will require 200,000 plants of each variety in order to cre-

ate the effect necessary. Along the south edge of the South gardens a very unique effect is to be created. A hedge twenty feet in height will be placed on either side of the main entrance at Lombard and Pierce streets, this hedge running from the Horticultural building to Fillmore street. It will be 1150 feet in length and will be eight feet wide, while it will be clothed with *Mesembryanthemum spectabilis* for which it



Some sylvan effects in the Exposition grounds.

will be necessary to provide 7500 boxes of this plant, the boxes being 6x2 feet. Practically all of these boxes have at present been filled and the plants established. Experiments in connection with this work have been going on in our nurseries for the past year and a half, and have proved most successful, so that in spite of the fact that work of this character has never before been attempted, there is no doubt of its being a success.

Four large groups fifty feet in height have been planted on either side of Festival Hall and the Horticultural Building in order to properly frame in and correspond to the domes on these buildings. They have now been in place for a period of six months and consist of Monterey cypress, Monterey pine, *acacia mollissima*, *acacia floribunda*, banked up with *euonymus japonicus*, *laurustinus* and *veronicas* in variety, while specimen plants of Lawson cypress and *Thuya gigantea* interspersed in the surrounding lawns make a finish to the groups.

Naturally it is aimed to make a special feature of the planting of the courts, each one having a distinctive and individual character.

The Main Court, or Court of Honor, will be distinguished by a formal sunken garden surrounded by trees of eucalyptus averaging twenty-three feet in height and planted so as to form a solid hedge nine feet in diameter fifteen feet from the ground; that is, the trees will have in each case a straight stem of fifteen feet in height before branching, and the foliage of the tree clipped in a square form. Myrtle hedges will be used in this court and against the buildings, while pillar roses and climbing plants will be very freely used.

The same effect will be carried out in the treatment of the North Avenue leading to the Court of Honor. Surrounding and inside the main tower it is proposed to use specimen conifers, pyramid bay trees and specimens of *Eugenia myrtifolia* twenty feet in height, while the

main tower will be flanked with groups of Italian cypress 35 to 40 feet high. In this connection it is interesting to note that these specimens of Italian cypress are all boxed and established at San Jose and will be shipped to the Exposition grounds within the next two weeks.

In the West Court, or Court of the Four Seasons, an evergreen treatment of trees and shrubs will likewise prevail. Here it is proposed to use some of the higher types of acacia trees, *Pittosporum crassifolium*, *Choisya ternata*, etc., while color will be given by the free use of specimen bougainvilleas, which have been trained in columns twenty feet high. Pillar roses of the same height, hybrid rhododendrons and in the pools abundant color will be given by the use of water lilies.

In the East, or Court of Abundance, one of the main features of planting will be the orange trees which it is proposed to transplant from the interior valleys in full bearing. These plants are at present all in boxes, but on account of the fact that the orange tree will not bear fruit in San Francisco, it will be necessary to maintain them in their present localities until the fruit is ripened, so that they cannot be placed in their permanent positions until next December. One hundred orange trees ten feet high and eight feet in diameter, with their foliage touching the ground, have been already provided for this court. In addition to these will be used magnolias and formal Italian cypress, while abundant color will be provided by the use of spring flowering bulbs and summer flowering annuals.

The Court of Flowers, because of its name, will naturally be made a feature of by the free use of bright colored flowering plants. It will also be distinguished by a magnificent collection of sub-tropical plants placed in the flower beds and spaced about ten feet apart, while azaleas and a magnificent collection of beeches will be utilized in this garden.

In the Court of Palms a fine collection of different varieties of palms will be used, and it is also aimed to place in this court

a collection of sweet-smelling shrubs, such as myrtle, Breath of Heaven, lavender, lemon verberna, Rose Marie, etc.

In this connection it may be of interest to mention a few words regarding our nursery work and the method of handling our stock. We have on hand in the nurseries at the present time approximately 200,000 plants, among which are 43,000 eucalyptus which are now twenty feet high.

Work on these plants was started a year and a half ago, at which time the plants were six inches high and were in flats. They were immediately transferred into other flats



Cypress used largely in shading.

and spaced about six inches apart, and the flats were then placed on hot beds. After six weeks of this treatment they were transferred into 12-inch boxes. They remained for a period of approximately eight months, and they are now in 18-inch boxes and making a vigorous growth. We anticipate that these plants will be approximately twenty-five feet in height at the time of the opening of the Exposition.

We have also on hand 5500 acacias in variety. They received the same treatment, with the exception that in a great many cases some of the varieties, such as *Lophantha floribunda* and *latifolia*, have been trained in standard form, with most excellent results. The *Lophantha* now stand five feet in height and the heads are four feet through. We anticipate having five-foot heads

on these plants by the time of the opening of the Exposition.

We also have on hand 2200 fuschias in 12-inch boxes, likewise some of these are being trained to a standard form. There are also 6000 hydrangeas in 18-inch boxes, and we anticipate to have these plants four feet through in another year and a half. Marguerites, pelargoniums and geraniums of many varieties have likewise been placed in boxes and are giving most excellent results for tub and vase work. Mesembryanthemum spectabilis. Muehlenbeckia complexa pink and red ivy geraniums have been established in boxes six feet long, two feet wide and two inches deep, the soil protected by heavy wire mesh, and we contemplate using these boxes to decorate the walls and columns of various buildings.

We also have established in boxes 500 bougainvilleas, which are now fifteen feet high, which we expect to have twenty feet in height when they are set in place. Many thousands of Passion vines and Meuhlenbeckias have also been established in boxes and are giving good results.

In boxing our large specimen trees the following method has been followed: The trees are side-boxed and after the roots have been cut three inches of space is allowed between the ball and the sides of the box, and this 3-inch space is secured with good surface soil, so as to start side-root action. The plants are mulched and watered for a period of some four to six months, when the bottom of the box is put on. We have found this method most successful in transplanting large palms and trees in general.



"MEDICINE FOR THE MIND"

The Library Committee, consisting of Messrs. Britton, Baum, Walton and Baloun, announces that from the mottoes submitted it has selected the following: "Medicine For The Mind."

Mr. Burnett Sheehan of the Auditing Department, San Francisco District, wins the prize of five dollars. The adopted motto will be subscribed to the name of the Library and will appear on its stationery.

The Department of Mines of the Geological Survey of Canada has donated four very interesting magazine pamphlets. One covers the fascinating subject of the "Myths and Tales of Southeastern Ontario"; another the geology of several districts of Vancouver Island; the other two have full illustrations, the one dealing with the archaeology of Southern British Columbia, and the other covering the field of clay and shale deposits of New Brunswick.

Mr. H. C. Vensano presented a pamphlet on the "Depreciation of Public Utility Properties as Affecting Their Valuation and Return."

The number of bound volumes on hand to date is 485, pamphlets 2293, maps 25, magazines that are purchased 6 and the magazines received in exchange for PACIFIC SERVICE MAGAZINE 10. It will be of interest to mention that the six magazines subscribed for consist of the Scientific American, World's Work, National Geographic Magazine, Travel, Popular Mechanics and Popular Electricity. These magazines may be borrowed from the library and kept for a period of three days. The following ten magazines are received by exchange: General Electric Review, The Dodge Idea, Ideal Power Current News, Oildom, Valve World, Edison Monthly, Pacific Telephone Magazine, Standard Oil Bulletin and Penberly Engineer and Fireman. J. P. B.

Irrigating by Means of Electric Power in Yolo County

By W. E. OSBORN, Manager Woodland District

THE word Western is an alluring term, and Yolo County is of the West—one of the most alluring goals. Its western boundary is along one of the extended ridges of the Coast Range mountains, which forms a watershed



W. E. Osborn

that has for countless ages deposited, and even today is still depositing, rich alluvial soil over the sloping floor of the valley almost to the county's eastern border along the Sacramento River. The depth of this rich deposit and the extent of its area makes Yolo County a most attractive spot for the homeseeking farmer from the Far East, as well as for the sons of the old pioneers who have in the past reaped many rich harvests.

The key to future and more diversified development in the agriculture of this county is irrigation, and while over a

part of this land irrigation has been carried on by diverting the waters from Cache Creek, it is only within the last few years that the use of electric energy has induced the farmer to irrigate his land from wells. In the year 1910,

while electric power was quite extensively employed within the city limits of Woodland, there were only two electric motors in use for irrigating purposes without the city limits; one of 3 h. p. in a vegetable garden and one of 2 h. p. in the cemetery. Since that year the Pacific Gas and Electric Company has so far extended its distributing lines in the county that today a grand total of over fifty miles of 11,000-volt pole-line has made this wonderful energy available to many farmers and, in place of only 5 h. p. 2500 h. p. has been harnessed by the



Type of centrifugal pump used for irrigating Yolo County alfalfa lands.

farmer to centrifugal pumps in units varying from 5 to 150 h. p. for the purpose of irrigating alfalfa, sugar beets, grain, corn, orchards and vineyards.

To the casual observer of Yolo County the land seems to be quite level, but on a more careful survey it is apparent that running from the foothills are a series of low ridges. Each one of these ridges evidently marks the course of an ancient creek channel, for on boring wells along the slopes of these ridges a substantial deposit of gravel will be surely found. The most notable of these ridges is known as the Knight's Landing ridge, running from Cache Creek at the town of Yolo in a northeasterly direction to the Sacramento River at Knight's Landing. Quite a number of wells have been bored along this ridge, and gravel strata of over sixty feet in thickness have been found; and it is along the slope of this ridge that irrigating from wells has grown to large proportions, for instance, a branch 11,000 volt line, only three miles long, has 563 h. p. in motors for irrigating.

Adjacent to Woodland on the north a splendid underground stratum of gravel, requiring wells of not over sixty feet in depth, has proven the benefits of irrigating by electric power from bored wells. The illustration shows a 20 h. p. direct-connected motor and an 8-inch centrifugal pump throwing a stream of 1800 gallons of water per minute. This land is of such fine quality it will grow alfalfa without irrigation until the gophers destroy it. The first irrigation from this plant caused the death of over 2500 of these pests on forty acres of ground, and it aided materially in restoring the alfalfa.

Some of the Yolo farmers, finding that with pumps driven by electric power they can obtain an abundant flow of water just when they need it, are raising at least two or three crops a year, one of grain and one of corn or pumpkins, all on the same tract of land; which clearly shows that diversified farming

has taken a foothold in Yolo County. Of alfalfa from five to six crops are harvested each year, yielding from eight to ten tons per acre.

In installing a pumping plant the first thing to do is to locate the water-bearing stratum of gravel by boring a small test-well. After finding the distance to gravel, the quality and thickness of the stratum, a series of wells, usually twelve inches in diameter, are bored and cased up with a casing properly perforated. By testing each well with a small six-inch centrifugal pump, it is an easy matter to determine the size of pump that may be connected to two or more wells to give a certain volume of water. Any reputable pump firm can tell the power required to lift that volume of water. The farmer is then in a position to enter into a contract with the Pacific Gas and Electric Company to furnish the required horse-power for a term of years.

The cost of irrigation per acre depends upon several factors: the depth of the water level in the surrounding land, the character of the wells supplying the water and, also, the character of the soil, light, loamy soil requiring more water than heavy soil. In the neighborhood of Woodland farmers claim that the cost for irrigating alfalfa is from fifty to seventy-five cents per acre for each irrigation.

Now that irrigation has so far developed the farmer is looking to additional uses for electric power. The dairyman, especially, finds that by installing motors to chop feed or to fill silos he obtains an economic advantage. Another feature is the introduction of refrigerating plants for cooling milk and cream before shipment to the larger centers of distribution, such as Sacramento and San Francisco. I hope to treat of these additional activities in a later article. All this, including pumping, refrigerating and economic fodder-handling, together with the use of electric light in the dairy, tends to closer knit the farm life with the business life of the metropolis.

Query: Is the Sir Joseph Hooker Oak the Largest in the World?

Interesting Discussion Over This Famous Tree Which Is the Pride of the Bidwell Ranch, near Chico, California

IN the April number of PACIFIC SERVICE MAGAZINE, under the heading "Jottings from Districts and Divisions," there appeared a paragraph concerning a wonderful spreading oak tree, called the Sir Joseph Hooker oak, on the Bidwell ranch near Chico. The paragraph stated:

"Manager Heryford joins the natives of the Chico district in calling this the largest oak in the world. Following are its dimensions: Height, 105 feet; circumference of trunk at ground, 25.7 feet; 8 feet above ground, 24.8; length of limbs of south side, 101 and 105 feet, respectively; on the north side, 99 feet; circumference of circle outside branches, 446 feet. Allowing 2 square feet to a person, the number that could take shelter under the spreading branches of this magnificent oak is estimated at 7885."

The paragraph referred to has started quite a discussion upon oak trees in general and, of course, the Sir Joseph Hooker oak in particular, the main point of dispute being whether this is or is not the largest oak in the world. In his desire to obtain first information upon the subject it occurred to the editor of PACIFIC SERVICE MAGAZINE to correspond with Prof. W. A. Setchell of the Department of Botany in the University of California. The communication brought forth the following reply from Prof. Setchell:

Berkeley, Cal., May 23, 1914.

DEAR MR. MYRTLE:

Your letter of the 21st in regard to the oak at Chico has come to me and I may call your attention to a statement made by Professor W. L. Jepson in his book on the trees of California, entitled "The Silva of California." On pages 203-206 speaking of *Quercus lobata* or Valley Oak, he says:

"Trees of remarkable height, span of

crown, or diameter of trunk are rather numerous and often have more than a local reputation. The most famous one is the great tree on the General Bidwell Ranch at Chico, which was named the Hooker Oak in honor of Sir Joseph Hooker, long time Director of the Royal Gardens at Kew, England, who in company with Asa Gray visited the tree in 1877. It is in every way a fine representative of its race. The largest tree, considering all dimensions, is the Henley Oak in Round Valley. It is one hundred and fifty feet in height and nearly twenty-five feet in trunk circumference at four feet above the ground. There is a notable tree between Kelseyville and the Indian Mission. The great oak of Big Oak Flat, destroyed by the miners in early days, was of this species and said to be eleven feet in diameter. At the lower end of Scott Valley near the Blue Lakes road is a tree with a height of one hundred and twenty-five feet and a trunk forty-five feet high before branching into the narrow crown. At five feet above the ground the trunk is three feet eight inches in diameter. It was measured in 1897 and is shown in plate 64. The bark is of a different character from the ordinary *Quercus lobata* bark and is shown in plate 65. Many other trees of this type at one time grew in the neighborhood and in the lower part of Bachelor Valley, and were undoubtedly crowded when young, thus pushing the survivors up to this exceptional height. Other trees which have been measured find a place in the following tabulation:

"INDIVIDUAL VALLEY OAK TREES.

"Location of tree. 'Olney Oak' on the Olney Ranch near San Ramon Valley. Diameter of trunk, 6 ft. 2 in. at 3 ft. 6 in. above ground, 8 ft. 2 in. at ground. Span of crown, longest diameter, 109 ft. 1 in.; shortest, 93 ft. 3 in.

"Location of tree, Suisun Valley, one mile west and northwest of Manka's Corners. Height, 75 ft. Diameter of trunk, 5 ft. 3 in. at 4 ft. above ground.

"Location of tree, Upper Ojai Valley. Height, 130 ft. Diameter of trunk, 6 ft. 6 in. at ground. Span of crown, 120 ft.

"Location of tree, Round Valley, upper end. Height, 90 ft. Diameter of trunk, 7 ft. at 5 ft. above ground.

"Location of tree, Potter Valley, near



The famous Sir Joseph Hooker oak, on the Bidwell ranch near Chico, California.

Hahn's Ranch on county road. Diameter of trunk, 7 ft. 10 in. at 5 ft. 6 in. above ground.

"Location of tree, Willits, south side of town. Height, 100 ft. Diameter of trunk, 7 ft. 4 in. at 5 ft. above ground.

"Location of tree, Eshom Valley, north end. Height, 110 ft. Diameter of trunk, 7 ft. 8 in. at 4 ft. above ground.

"Location of tree, Eshom Valley, south end. Height, 70 ft. Diameter of trunk, 9 ft. 5 in. at 3 ft. above ground, 11 ft. 6 in. at ground.

"Location of tree, Priest Valley, north fork of Lewis Creek. Height, 85 ft. Diameter of trunk, 8 ft. 5 in. at 5 ft. above ground, 11 ft. 1 in. at ground.

"It will be noted that the very largest trees are not restricted to any single region, but occur in every locality throughout the main range."

I am very glad to see the copy of the April number of the PACIFIC SERVICE MAGAZINE and note the marked paragraph referring to the "Hooker Oak" of Chico. Concerning your further question in regard to this oak being the largest one in the world you will understand Professor Jepson's opinion from the paragraph slated above. As to the European oak I have no figures immediately ac-

cessible, but the diameter of the trunk of the English oak is given as seven meters. This is a little over twenty-one feet. This would mean a circumference in the neighborhood of sixty feet. The height of the European oak might not surpass that of the Hooker Oak but the spread of limbs is likely to be equally great. The diameter of the Hooker Oak, judging from the statements made, cannot be much over eight feet, which compared with twenty-one or two feet in the case of *Quercus pedunculata*, although the latter is not definitely specified as to height above the ground, nevertheless makes the discrepancy very evident.

If I can lay my hand on further data in the course of the next few days I will let you know about it, but this matter of the diameter will, I think, effectively answer the question as to whether the Hooker Oak is the largest oak in the world or not.

Very sincerely yours,

W. A. SECHURLE.

The editor of PACIFIC SERVICE MAGAZINE will welcome any further information that may be forthcoming upon this most interesting question.

"Pacific Service" Plan for Permanent Financing Meets General Approval

OUR Company's plan of permanent financing, particulars of which were set forth in a letter addressed by President F. G. Drum to the stockholders June 3rd, has already "caught on," so to speak. In a supplementary letter bearing date July 1st, Mr. Drum, in behalf of the Board of Directors, announces that upon the affirmative vote of substantially more than the required two-thirds of the outstanding capital stock the plan was formally adopted at a stockholders' meeting held at the Company's headquarters, 445 Sutter Street, San Francisco, on June 29th.

Previous to that meeting reports from the offices of the Treasurer and Secretary showed that the stock was being subscribed for most liberally, and the utmost confidence was expressed that by August 15th next, the date agreed upon, there would be more than the sufficient amount of stock subscribed for to render the plan operative. The Railroad Commission of the State of California, in a written opinion authorizing the issuance of new preferred stock, which is the basis of the plan, made the following favorable comment:

Applicant's plan to sell its new first preferred stock appeals to us as thoroughly sound and commendable. It will enable applicant to refund the outstanding gold note issues of \$7,000,000, put additional security behind applicant's bonds, help take care of the margin between the 10 per cent of construction expenditures and the 90 per cent face value of bonds which applicant can issue against construction expenditures, and probably result in an increase in the price to be secured for its general and refunding bonds hereafter issued. The plan is in accord with suggestions for junior financing which have been made by this Commission from time to time to various public utilities and is worthy of emulation, in so far as applicable, by other utilities.

With respect to that feature of the plan providing for an exchange of the present preferred stock for the new preferred stock, on the basis of 10 shares of the old stock for 10½ shares of the new, the Commission expressed itself as follows:

While this exchange will result in some additional securities over those now outstanding, it is an integral part of a general plan which will materially improve applicant's financial condition and which is worthy of commendation from the public authorities.

The Commission's order grants authority to the Company to reimburse its treasury for \$11,586,661 expended for plant additions and not heretofore capitalized. This will make it possible to utilize the proceeds of subscriptions to the First Preferred Stock to free the Company from all floating debt, and to give it a net working capital which, with accretions from surplus earnings, should exceed \$5,000,000 prior to the resumption of the dividends on the common stock to which the Board pledged itself in Mr. Drum's letter of June 3rd in the event that the necessary support shall be accorded to the plan by the Company's stockholders.

President Drum's supplementary letter gives some very encouraging information on the subject of earnings. It states:

Since the issuance of letter of June 3rd to stockholders, the May, 1914, earnings have become available and we, therefore, reproduce the following statement contained in that letter with the addition of these more recent earnings:

EARNINGS, ETC., FIVE YEARS ENDING APRIL 30, 1914.

Year Ending April 30	Gross Revenue	Net Revenue	*Net Revenue after Bond Interest and Discount	Annual Dividends on New Preferred Stock	Balance	Annual Dividends on Present Preferred	Balance for Common Stock and Depreciation Reserve
1910.	\$13,816,904	\$ 6,011,442	\$ 3,028,644	\$ 750,000	\$2,278,644	\$600,000	\$ 1,678,644
1911.	14,260,232	6,225,993	3,173,726	750,000	2,423,726	600,000	1,823,726
1912.	14,546,775	6,323,500	2,902,729	750,000	2,152,729	600,000	1,552,729
1913.	15,179,189	6,409,551	2,610,536	750,000	1,860,536	600,000	1,260,536
1914.	16,556,673	7,336,294	3,361,782	750,000	2,611,782	600,000	2,011,782
YEAR ENDING MAY 31, 1914	16,614,801	7,430,948	3,463,536	750,000	2,713,536	600,000	2,113,536

*Excluding charges account floating debt as this debt will be paid from proceeds of new stock issue.

That the Board's forecast for the year 1914 of at least \$3,800,000 net earnings after bond interest and discount will be realized is indicated by the following statement of gross and net revenues and balance after bond interest and discount, during the month of May, 1914, and during the five months ending May 31, 1914, as compared with the same month and period of the preceding year:

	MONTH OF MAY			FIVE MONTHS ENDING MAY 31ST		
	1914	1913	Increase	1914	1913	Increase
Gross	\$1,368,892	\$1,310,765	\$58,127	\$7,208,552	\$6,706,089	\$512,463
Net	646,156	551,502	94,654	3,543,326	2,983,509	559,817
Net Revenue after Bond Interest and Discount	314,501	222,686	91,815	1,883,835	1,351,656	532,179

At May 31, 1914, the Company was serving 356,569 consumers, an increase in 12 months of 30,196. The net additions in the first five months of 1914 exceeded those of the same months of the preceding year by 1743. As the average gross revenue per consumer in 1913 was \$45.40, it can be readily seen to what extent the earning capacity of the Company has been permanently increased by this new business.

Mr. Drum directs attention to the fact that under the terms of the offer of June 3rd, stockholders have two options of payment, namely:

(1) The entire purchase price of the first preferred stock subscribed for may be paid at one time, in which case subscribers will begin to earn on their investment at the rate of 7.27 per cent per annum from August 1, 1914 (6 per cent being paid during the interim), and will receive permanent certificates for the new stock as soon as the same can be prepared after the plan becomes operative.

(2) Subscriptions to the stock may become effective on the payment of \$5 per share accompanying the subscription, the balance of the subscription, under this option, being payable in easy installments as set forth in letter of June 3rd. This affords the opportunity to stockholders, who may not find it convenient to pay the entire purchase price at one time, of nevertheless making their investment upon the favorable basis now offered, either for permanent retention by paying the remainder of the purchase price in easy installments over a period of 15 months, or of utilizing the opportunity of reselling their stock in the better market which should prevail after the plan has been announced operative and there has been a return to more normal conditions in the general market.

His letter closes with the following call upon the stockholders for their earnest co-operation:

Subscriptions to the First Preferred Stock are being received at a satisfactory rate and, while your Board believes that it will receive the support and co-operation of a sufficient amount of stock to make the new plan a success, it nevertheless feels that it should not neglect this opportunity of again impressing upon the stockholders that in offering this stock to them at the minimum price authorized by the Railroad Commission of California, it has relied entirely on their hearty co-operation. We trust, therefore, that no single stockholder will withhold his support in the belief that it is unnecessary, as the multiplication of such instances may jeopardize the success of the plan.

Of the total number of stockholders who have to date forwarded their subscriptions, about 40 per cent have subscribed for more than their allotment. We regard this as a substantial endorsement of the opinion expressed in our former letter that subscriptions to this stock are merited solely from an investment standpoint entirely aside from the collateral benefits which stockholders will derive from the consummation of the plan. The new stock is tax exempt in California; the dividends derived from it are not subject to the normal Federal Income Tax; its intrinsic value is largely in excess of the issue price and in our opinion its market value will be established on a favorable basis if, as your Board hopes, there is a practically unanimous subscription on the part of stockholders.

The success of this financing which, obviously, is dependent upon the amount of stock subscribed for, is in the interest alike of the present preferred and common stockholders. It represents the first adequate plan which has met the approval of your Board, of the Railroad Commission of California, and of the bankers of the Company, and which provides satisfactorily, in connection with the authorized issue of General and Refunding Bonds, for all the necessary capital expenditures of the Company. It will place the Company in a position to finance itself, to protect its business and to secure new business from the rapidly growing territory served. It will also permit the distribution to the Common Stockholders of a fair proportion of the very satisfactory earnings which are being shown on this stock after meeting prior charges and obligations of every kind. From the standpoint of the preferred stockholders, it is doubtful whether in any other legal way they could secure the eventual exchange of their stock for a larger amount of non-assessable first preferred stock approved by the Railroad Commission of California.

In order that it may proceed without delay with the financial plan which has been authorized and with important matters contingent thereon, your Board requests that subscribers be forwarded at the earliest possible moment.

EMPLOYEES INVITED TO SUBSCRIBE.

In a circular letter addressed to all officers and employees of "Pacific Service," bearing date July 1st, Vice-President and General Manager John A. Britton, announces that the Board of Directors, in a resolution adopted June 3rd, authorized the management to give to its employees the opportunity to subscribe for the new preferred stock upon the same terms and conditions offered to the stockholders. These terms and conditions were set forth in the original circular sent out by President Drum and reproduced in the June issue of PACIFIC SERVICE MAGAZINE.

Recommending to his employees the advisability of their availing themselves of this opportunity to become stockholders in the Company upon those most favorable terms, Mr. Britton says:

It is deemed unnecessary to enter into details regarding the property and business of the Company, as this is information which every employee has at first hand. The management, however, has no hesitancy in stating that it regards this new First Preferred Stock as an investment security of the highest character and one which it can recommend to its employees with the utmost confidence that their investment will be safe and will increase in value. The value of the property back of the stock exceeds its face value and the earnings of the Company, after the payment of operating expenses, taxes, bond interest, etc., are between four and five times the amount of the dividends.

MEMBER OF PROMINENT BOND FIRM THINKS PLAN WILL STRENGTHEN
COMPANY'S SECURITIES.

Mr. George K. Weeks, of N.W. Halsey & Co., predicts that the general and refunding bonds of the Pacific Gas and Electric Company will advance five points under the influence of the new plan of financing. Upon this subject Mr. Weeks is quoted by the daily press of San Francisco to the following effect:

The new financial plan of the Pacific Gas and Electric Company which has just been announced seems admirably adapted to meeting the Company's requirements and safeguarding the position of all existing security holders. As the Pacific Gas and Electric Company in promulgating this plan is one of the first important utilities to follow the suggestion made in a formal opinion of the Railroad Commission that all California utilities should raise a portion of their new capital from stockholders, I assume the plan will meet with the approval of the Commission. If approved by the Commission and rendered effective by subscription on the part of the stockholders for the new preferred offered, which is certainly an attractive purchase at the issue price, I believe that it would be logical to expect an advance of at least five points in the price of the general mortgage five per cent bonds. It will be remembered that the first issue of the general mortgage 5s was put out by ourselves and associates in the early part of 1912 at 92½. This price was fixed because the bonds were considered intrinsically worth that figure, and it was believed that future issues could be sold at an equal or higher figure. There has been a decline in the price of the bonds due in part to general market conditions, and in part to the feeling on the part of investors that too many mortgage bonds were coming out, and that even recognizing the exceptional territory of the company and the advantages to be secured by additions to its system, the Company's financial plan should be so adjusted as to provide for substantial investments by the stockholders and minimize the amount of additional refunding mortgage bonds coming on the market. The new plan so fully meets this condition that, as indicated, it seems to me it justifies an expectation that the price of the bonds will in consequence fully reach if not surpass the figure of 92½ set by the bankers in their original issue.

BOSTON PRESS PRAISES OUR ANNUAL REPORT.

Our annual report, recently issued to the stockholders, concerning which some very favorable comments appeared in the press of San Francisco, appears to have found equal favor with the journals of the East. We quote the following from the "Boston Commercial" in its issue of Saturday, June 20, 1914, under the heading, "Pacific Gas and Electric, despite handicaps, earns in 1913 practically what was forecast in 1912":

"The Pacific Gas and Electric Company has issued its report for the year ended December 31, 1913, and we must say it is the most detailed and complete document of this kind that we have ever been privileged to study.

"Every phase of the corporation's activities has been covered by figures, explanation, charts, maps, and in the case of the property and equipment photographs are presented showing the different types. Painstaking effort has evidently been taken to make the data understandable and nothing is hidden in technical engineering terms or by intricate bookkeeping methods. Every stockholder who peruses this report cannot fail to get an intelligent and comprehensive idea of the property, the ownership of a portion of which is represented by his securities."

TIDINGS FROM DISTRICTS AND DIVISIONS

OAKLAND, BERKELEY AND ALAMEDA COUNTY DISTRICT:

The Oakland District under the heading of District Items submits the following in competition with other districts in the system. These figures cover Richmond, known as the "Pittsburg of the West":

For year ending January 1, 1914, gain of gas services in use, 286, or 27%; gain, meters in use, 393, or 39%.

Land traveling like a glacier is an actual fact in Berkeley. About six years ago Cedar and Euclid avenues, which lie on a steep hillside, slid about two feet. This caused considerable damage to the street, sidewalks and dwellings and also involved property rights, owing to the shifting of property lines. There has been a slight movement of the land at various times since; especially during the winter, when the ground is softened by the rains.

It recently became necessary to lay a gas main on Euclid avenue, and to do this required the cutting of a piece out of a 6-inch main that lies in Cedar street, which crosses Euclid at right angles. A 6-foot trench was opened in Cedar street so as to cut a piece out of the 6-inch main for the insertion of the tee connection. When the first circular cut around the 6-inch pipe was completed, the downward pressure of the hill was so great that the ends of the pipe thus cut were forced into each other, splitting the pipe in so doing. It was a surprise to see the ends of the pipe shoot past each other and thus telescoping for about six inches. It is remarkable how this pipe has stood this enormous strain for so many years without buckling, as

there is considerable fall in the street grade.

A Berkeley paper recently announced that the Gas Company had just completed putting in a 24-inch "gas conduit" on Adeline street. This news item followed the completion of a new gas main along Adeline street from Grove to Bancroft, covering 400 feet 24-inch cast iron pipe, 300 feet 20-inch and 2300 feet 16-inch.

The size of this main shows the progress that Berkeley is making towards becoming a city of importance.

The Electric Distribution Department of Oakland has just completed the reconstruction of the old twin 60 k. v. line on Jones avenue, Elmhurst, between East Fourteenth street and the S. P. R. R. The old 60-foot poles have been replaced with 75-foot and 80-foot poles.

Five sections of Ohio brass suspension-type insulators have been used. This work was done for and under the supervision of the O. and M. Department. The new line makes a very creditable appearance.

Some idea of the rapid development of Berkeley and the big strides "Pacific Service" is taking in this district can be gained by the following item clipped from the columns of the weekly edition of "The Courier," and we hope before this work is completed to furnish the readers of this magazine some good views showing work in construction as it develops:

GAS COMPANY PLANS BIG IMPROVEMENTS.

New work now being carried on by the Pacific Gas and Electric Company will provide that section of Berkeley south of Bancroft way and east of Shattuck avenue with a modern and up-to-date distributing system and round

out the installation of a general city-wide plant that will meet the demands of increasing growth and population for many years. The work now under way will cost about \$90,000 when completed, which will be in about two months. The gridiron laterals will lead from a main trunk along Adeline street and Shattuck avenue, the high pressure line from Oakland along Grove street being tapped near Adeline and Woolsey streets. The main along Adeline street will be twenty-four inches in diameter, falling to twenty inches as it comes north on Shattuck.

The largest of the laterals will be the new main along Prince street east from Adeline. This will be sixteen inches in diameter and will follow Prince to Telegraph and thence along Webster to Claremont park district where 8-inch mains will radiate to supply the different consumers along Hillcrest avenue, Domingo avenue and in the Uplands and other districts.

New 8-inch mains are being laid east on Ward to Telegraph, east on Parker from Shattuck to College and on Stewart street from Shattuck to College.

It required forty-one big freight cars to carry the pipe used in this work from the East and the total freight bill was over \$11,000.

Up to a few months ago it was always a question of doubt in the Berkeley office as to where the Assistant Manager held sway, but this has now been definitely determined since the erection in the front end of the office, facing the street, of a *sanctum sanctorum* that does credit to the office and a pleasure to designate when inquiry for direction is desired by consumers.

In compliance with the "All Concerned" letter purporting a desire to have each district forward data of interest to the editor of PACIFIC SERVICE MAGAZINE, a spacious box has been installed in the Berkeley office as a receiver of such hints as employees might deem worthy of mention. This box is under lock and key and is only to be opened by the custodian a few days prior to the time necessary for such information to be in the hands of the editor. We feel this a good suggestion for other offices, as an employee will sometimes write when timid of verbal expression. He need not sign his name and the acceptance of his data can rest with

the custodian's discretion. If approved of however, inquiry can be made and the writer notified that his idea is to be molded into form, and forwarded to the magazine over his signature.

Mr. Fred Folsom, connected with the Commercial Department of the Berkeley District for the past four years, is to be associated in the future with the Commercial Department of the Oakland District, and Mr. C. M. Converse, who was formerly of the Collection Department of the district, but connected recently with the Commercial Department of the Oakland District, is to succeed Mr. Folsom.

The opening of Excelsior avenue from Lake Shore boulevard to East Thirty-seventh and Hopkins streets, and of Twenty-third avenue from East Thirty-first north to Hopkins street, will provide additional outlets for the residence districts composed of Fourth Avenue Terrace and Fourth Avenue Heights, known as the Glen View District, situated on the line of the Fourth avenue street-car, beyond the F. M. Smith residence in East Oakland.

The grading of Excelsior avenue is expected to start some time next fall. This will provide a short route from the above named district to North Oakland and Berkeley by Grand avenue and Broadway.

The Glen View District is at present the scene of considerable activity in the building line, and is well served by our electric distribution system.

The company has just completed a small wood frame, corrugated iron garage in the town of Hayward, for the accommodation of the auto truck, which is used for line work in Alameda County. This garage is located on the company's property adjacent to the railroad, and close to one of the main streets.

Hayward is the logical center of Alameda County, being accessible to the Livermore valley, and has been made the headquarters of the line crew.

OAKLAND POWER DIVISION:

Work in connection with the installation of the third 1000 k. w. motor-generator set and reconstruction of the D. C. switchboard at Station "H" in the Oakland Power Division is nearing completion.

The new machine is to be a Westinghouse two-bearing set, consisting of a 1000 k. w. 600-volt D. C. commutating pole-generator directly connected to an 11,000-volt synchronous motor rated 1440 h. p. at .8 power factor.

This is the eighth 1000 k. w. motor-generator set installed in Oakland and Berkeley and with a number of smaller sets previously installed makes a total 11,400 k. w. capacity of direct current 600-volt generators in this division.

MARYSVILLE DISTRICT:

A new lamp-black separator is being installed at the gas works and will be completed in July. The grounds around the new holder have been beautified, and flowers planted. The old holder at B and Second streets has been painted, more flowers planted, and a coat of gray paint applied to the buildings.

About twelve new residences are being constructed on Fourth street, all of which will be supplied with "Pacific Service."

We installed a 75 h. p. motor in June for the Sutter Basin Co., pumping water for keeping dredgers afloat, in addition to 80½ h. p. for other parties. The pumping season is now beginning to show activity in Sutter and Yuba counties.

A new bridge is to be constructed on the extension of D street, across the Yuba River, by the County Board of Supervisors, at a cost, approximately, of \$120,000. Electroliers will probably be installed with series system of lighting.

It is also proposed to install a series lighting system on the approach to and on the new Feather River Bridge.

The terminal rate cases will be argued soon. Marysville, Santa Clara and San Jose, which are protesting the Santa Rosa decision, were represented at the special

hearing, and Attorneys Carlin, Johnson and Reddington, representing Marysville, put on a number of witnesses to testify that the position of this town as a wholesale and manufacturing center depends upon terminal rates and that Marysville has enjoyed them since the early fifties.

The town of Live Oak in Sutter County, is improving rapidly; also Gridley in the north, and Nicolaus in the south. Picturesque Sutter City is holding its own.

MARYSVILLE POWER DIVISION:

Mr. J. H. Fagg, who has been relieving Superintendent E. C. Johnson for the past six months, returned to Sacramento on July 1st, and Mr. Johnson resumed his active duties.

During the past month a new bank of 840 k. w. transformers and an entire new switching arrangement were installed on the 11 k. v. service in Marysville substation. These additions were necessary on account of the increased load in the rural districts.

The following is from the "Wheatland Four Corners" and speaks well for the satisfactory service that is being rendered by "Pacific Service," since all the plants mentioned therein are operated by power supplied from our Wheatland substation. To those that are unacquainted with this thriving little city, I might add that in addition to having some of the largest hop fields in the world, it is surrounded by rich alfalfa fields and orchards.

WATER APLENTY FROM PUMPS.

"Doubting Thomases" will have their fears speedily banished as to the possibility of irrigating by means of pumps if they will pay a visit to the farms of A. Riechers, A. G. Oakley and J. W. Davis, all of this vicinity.

These gentlemen have recently installed pumping plants that roll out the water in abundance and at a nominal expense. Mr. Riechers' plant throws a stream of eight hundred gallons per minute under normal conditions and his supply is unlimited. Mr. Oakley's pump has a capacity of one thousand gallons per minute and his well has shown no signs of failure under the most critical tests.

Mr. Davis' pump is not so large as the

other two mentioned, but he irrigates his own farm and has water to spare. Other pumping plants in this vicinity are equally successful.

SOLANO DISTRICT:

On the 16th inst., Mr. Britton favored this district by addressing the consumers on the question of rates and on the activities of the company in general. His clear, frank statements on the various costs which enter into the final delivery of electricity on the consumer's premises made a strong impression on his hearers, most of whom had very little idea of the company's costs other than the local expenses which they can see more or less for themselves. To use his own expression he "laid his cards on the table" and they could readily see that while they did not hold a royal flush, neither did he hold four aces.

The slides thrown on the screen by Mr. Britton in connection with his address gave a splendid idea of the company's activities and one prominent man said that he was staggered by the immensity of the developments which the company had been carrying on.

Manager Sedgwick writes: "On the 18th inst. Solano District was favored with a visit from Stephen de' Sigray, Special Emissary of the Hungarian Government. He had been sent to this country to investigate agricultural conditions and practice with a view to introducing better agricultural methods in his own country, with special reference to irrigation. He saw quite a little of Solano District, and was very much interested in a large number of features which were novel to him. He thinks we know how to do things in California."

Dixon, the "Dairy City," was this year on the itinerary of the Ellison-White Chautauqua System, which furnished a week's entertainment from June 19th to June 24th.

This item is of more than passing interest, in that Dixon is the smallest city

of sixty contracting for this organization; and it speaks well for the progressiveness of the community that it raised the necessary guarantee to secure this attraction. The Chautauqua was illuminated by "Pacific Service." On the evening of June 18th, Dr. S. E. Lynd, lecturer for the Panama-Pacific Exposition, gave an interesting discourse on the coming World's Fair, and by the aid of "Pacific Service" showed numerous lantern slides which were highly enjoyed by the audience.

SOLANO POWER DIVISION:

During the latter part of May the Vallejo and Northern, which is a branch of the Northern Electric system, started to run passenger cars between Vacaville and Suisun. They make several trips and give the people of Vacaville much better service than they have had. At Suisun the line connects with Southern Pacific. We supply power from our Cement substation for operating the line.

Work is being rushed on what is known as the West Sacramento Valley railroad, the first section of which is being built from Dixon straight south until it intersects the Oakland and Antioch, a distance of about eleven miles. All of the grading has been completed and work is being done on the bridges. This line expects to start operating cars this year.

Mr. H. Louvier, patrolman located at Knights Landing, took a vacation during the month of May. During this time he made a trip in his Buick car to Nevada. The trip over the Summit had to be made by train. He covered over one thousand miles during his absence.

Bids were opened recently for the construction of the trestles for the state highway which is to be built across the Yolo basin to connect Davis with Sacramento. This will be a part of the main road from San Francisco to Sacramento. The work is to be completed in three

hundred days after the contract is let. This road is quite important to the people of this section, to say nothing of the benefits to be derived by people around the bay that will make use of the road. Contracts have been let for other sections of this road, one being between Vacaville and Suisun and the other from Benicia to a point close to Cordelia.

Mr. W. Z. McBride, manager of the Vacaville Water and Light Co., came in contact with a 2200-volt wire while repairing an arc circuit on a pole and was rendered unconscious and knocked to the ground. He was rather badly bruised and slightly burned. He was laid up for about a week. Mr. McBride does not ordinarily climb poles but it happened that the complaint came in on Sunday and he thought that he could repair the service without calling out his men.

ELECTRA POWER DIVISION:

On June 19th a few friends of the Electra Club spent a most enjoyable evening at the clubhouse. Refreshments were served and there was dancing and cards until a late hour. There were about twenty-five present, counting the club members.

The Electra Club has been reorganized and doing better than before. Each member is assessed so much per month and the money goes toward buying books, magazines, graphophone records or anything in that line needed at the club.

Mr. B. A. Miller, first operator at Electra, was married on April 23d to Miss Ada Hunter of Dinuba, Cal. After spending two weeks' honeymoon they returned to Electra and are now living in a cozy cottage that had been prepared for them by the company.

Mr. C. Heffren, operator at Electra, has purchased a new 1911 Maxwell automobile. There is quite a garage here at present, there being three automobiles

and three motorcycles, besides the company's car.

FRESNO DISTRICT:

We have just completed the construction of six miles of 4-inch, 6-inch, 8-inch and 10-inch low pressure main lines, replacing the small mains heretofore in the heavily-built residence districts in the northeast part of Fresno. These main lines are all fed off the 16-inch trunk line laid in 1912 from the works, and will give one hundred per cent service in all this territory from this time on.

The City Board of Trustees are paving all the avenues connecting with the main highways into Fresno County. They have also made extensive improvements on many of the city streets. It is their intention to continue this work until all the main business and residence streets of Fresno are paved.

The new Griffith-McKenzie building, corner of J and Mariposa streets, is now occupied. It is a ten-story office building, exceptionally well equipped and first-class in every particular.

The Cory building, corner of J and Fresno streets, for many years the home of "Pacific Service," is being torn down and in its place will be a Class A four-story office building. There will also be \$35,000 worth of improvements on the interior of the Barton Opera House, which joins this structure.

The recent decision of the Supreme Court upholding the ruling of the Interstate Commerce Commission puts Fresno almost on a par with terminal points as to freight rates. Many commodities will get the same rate as terminal points, while on other commodities it means a reduction of not less than twenty per cent on freight rates. This means that Fresno will be the wholesale center for the big end of the San Joaquin Valley. It will mean a great reduction in freight



Rival chefs of the San Jose barbecue. Reading from left to right: Geo. W. Pollard, G. H. Atkinson, Oscar Dewey, Chas. H. Claytor.

rates on pipe to the company in future shipments.

The Board of Trustees expect to call a special election early in August on some annexation problems, and also on the proposition of turning all public utilities over to the Railroad Commission.

SAN JOSE DISTRICT:

On Sunday, May 17th, the office employees and heads of departments of the San Jose District, together with their families and friends, held a barbecue at Long Bridge, located about three miles from the town of Saratoga, in the Santa Cruz mountains.

The start was made from the company's office at 10:00 a. m. in four of the company's big auto trucks and old Sol shining at his best for such an outing. After a delightful trip through the foothills en route the party arrived at the grounds about 11:00 o'clock. Some of the boys being musically inclined entertained the party with some of the latest popular airs and everyone worked up a fine appetite tripping the light fantastic

until the barbecue was served at 1:00 p. m. It was sure some barbecue. Mr. Geo. W. Pollard, the chairman of the Good Eats Committee and chief chef for the occasion, was ably assisted by Messrs. G. H. Atkinson, Oscar Dewey and Chas. H. Claytor in preparing the feast, and as culinary artists these four can't be beat. One of the noticeable features of the occasion was the setting of the tables in the form of the company's trademark. The following menu was served:

Potato Salad	
Barbecued Beef	Barbecued Lamb
Spanish Beans	
Spanish Sauce	Pickles
Cheese	
Parisian Rolls	
Soda Water, Sarsaparilla, Ginger Ale	
Lemonade, Coffee	
Oranges	Ice Cream Bananas

After dinner dancing, baseball, quoits and other forms of amusement were indulged in for the remainder of the day. One of the most exciting events and which caused considerable merriment among the spectators was the tug-of-war between teams chosen by "Bob" Hargreaves and Arthur Caldwell, which ended after about two minutes' hard

work by the rope breaking, tumbling the participants in every direction. The rope was repaired but broke a second time, so that the judges called the event off. Thus ended the day which marks an epoch in the social affairs of the boys of the San Jose District. Everyone returned to their homes voting unanimously that the barbecue be made an annual affair.

Those present from outside districts were Mr. and Mrs. Henry Bostwick, Mr. and Mrs. E. W. Florence, and Mr. and Mrs. E. B. Henley.

SAN JOSE POWER DIVISION:

The 1500 k. w. 2300-volt A. C. generator at San Jose station, after having been shut down for some time, is now being run as a synchronous condenser. The steam end of this unit, which is a McIntosh Seymour engine, is used for starting and also for maintaining normal speed so as to keep the condenser in a "floating" condition after it is put on the line. With the field over-excited approximately twenty-five per cent, the machine carries a leading current of about 450 amperes without any signs of heating, which is remarkably well, as the generator is normally rated at 377 amperes. Lamp-black, a by-product from the gas works, is used for fuel, twenty tons of which being necessary to maintain the condenser in operation daily.

The result of this operation is that the power-factor of the line is brought up to about unity and consequently raises the high tension line voltage in this section about five per cent.

Owing to an increase of load on the Mountain View substation, it was found necessary to replace a bank of 150 k. w. transformers by 500 k. w. transformers. The sudden increase was rather unexpected and as there was not sufficient floor space for the larger transformers in the substation, the oil shed was temporarily converted into a substation. The peak on the station last year was

1620 k. w. for the months of May and June as compared with 2520 k. w. and 2160 k. w. this year.

Mr. C. A. Colley, an electrician in the San Jose Power Division, and Miss Pearl Spicer were united in marriage July 7, 1914. Miss Spicer for the past two years has been teaching in the Mission San Jose grammar school.

Mr. I. H. Linn, Assistant Superintendent of this division has recently become the proud possessor of an Overland roadster.

REDWOOD DISTRICT:

Now and then an employee in the discharge of his duties is often called upon to perform other tasks. Such was the case the other day with our popular gas superintendent, Mr. Walter T. Kellogg. While on his way with his "Ford" to a rush job in Daly City, near Lomita Park he saw in front of him a man under full steam ahead and followed by a 250-pound female inhabitant with a muzzle-loader, from which she had not removed the ram-rod after cleaning. Kellogg with quickness of thought immediately pulled up, jumped to the road, and with a monkey-wrench in one hand he threw back his coat and, displaying the buckle on his suspender, shouted, "In the name of the law, halt!" The fugitive immediately threw in the reverse and, with hands up, surrendered.

The lady informed Kellogg that the man had looted her house. Kellogg took him to Uncle Tom's Cabin, and asked Andy Burke if they had a police officer in these parts. Andy told him that the only person around there that knew anything about law was the town barber, who at one time was janitor in a justice court in Utah. Kellogg took his prisoner to the barber, but he would do nothing without a warrant, so Kellogg dropped the man out and went on his way. The barber, however, took no chance, but

tied the man's hands and feet with sack twine and hailing a passing vegetable wagon loaded his prisoner in and hauled him to San Bruno, then locked him up in a box car, and sent him on his way when freight 42 pulled out.

Another tribute to "Pacific Service":

PALO ALTO, CALIFORNIA,

June 18, 1914.

MR. MANAGER,

Pacific Gas and Electric Company,
Redwood City, Calif.

Dear Sir:

Permit me to thank you for your prompt action in granting my request. The pole has been placed most satisfactorily, improving the looks of my home a hundred per cent. I cannot other than congratulate you on the efficiency of your representatives, the care they bestowed on the work so as not to injure trees, shrubs and plants, and the good cheer and general satisfaction they created in the neighborhood. With such men in their employ it can no longer be said that corporations have no soul.

Again thanking you, I remain,

Very respectfully,

J. C. HOFFMAN.

STOCKTON WATER DISTRICT:

At Stockton the three suburban districts, North Stockton, Fair Oaks (on the east side), and The Homestead (on the south side), have recently held annexation elections and have voted to come into the city. This will increase the population of Stockton proper by some 8,000 or 10,000.

Besides the above, there are at present several new highly improved tracts being promoted and put on the market, notably, Tuxedo Park, two sub-divisions; Parkview Tract; North Oaks Tract; Yosemite Terrace Tract; Homequest Tract; Mossdale Tract; Sunset Tract; East Park; Olive Tract; Elm Tract, and others; some two thousand lots in all. Most of these tracts are provided with concrete sidewalks, curbs and gutters and with either

oiled macadam or asphalt macadam streets, parked spaces along streets, and shade trees. Building is progressing rapidly in all of them. The street-car lines are being extended into Tuxedo Park and Yosemite Terrace. The Pacific Gas and Electric Company is extending water mains into all of the tracts, and they are also provided with storm and sanitary sewers and gas and electricity.

"Pacific Service" has added two new 1000-foot wells to its pumping station No. 1, at a cost of about \$8000 and installed an air lift auxiliary at a cost of \$5000. The pumping capacity of all the stations is now 28,000,000 gallons per day, which is for the purpose of duplication. The highest demand yet made on the system is at the rate of 14,000,000 gallons in twenty-four hours.

C. V. Wilbur, inspector of Stockton Water District, who has recently been laid up with a severe attack of typhoid fever, is now at work again.

L. B. Baggio, assistant bookkeeper of Stockton Water District, has just returned to work after having been laid up from quite a serious operation on his foot.

SACRAMENTO DISTRICT:

There have been ordered for the Sacramento District six new pay-as-you-enter cars, California type. Delivery is expected not later than September 5th.

In the line of construction work Sacramento has just completed double tracking Second avenue and Twenty-fourth street, and Tenth street from Q to Y, both with 87-pound groove rail. The double tracking of Tenth street has brought joy to the Sacramento fans, as this is the line that leads to the ball-grounds. With this additional improvement the disposition of the players as well as the fans should be so improved that we are expecting that Sacramento

will win the greater part of the ball games in the future.

SAN FRANCISCO DISTRICT:

Organized effort seems to be the keynote of present day activities. The employees in the Electric Distribution Department of the San Francisco District of the Pacific Gas and Electric Company have felt for some time that they could better themselves and render more efficient service to the company by getting better acquainted with each other and, also, by acquiring a more intimate knowledge of the aims and motives of their employers; so a new organization whose efforts will be devoted to the welfare of its members along educational, social and protective lines, was added to "Pacific Service" Saturday, May 23d, when between forty and fifty employees of the Pacific Gas and Electric Company met and formed the "Pacific Service" Club of San Francisco, elected a set of officers and appointed executive, amusement, athletic and by-law committees.

The following officers were elected: Chairman, G. C. Hart; Vice-Chairman, J. E. Schoolcraft; Secretary and Treasurer, H. H. Hilliard; Sergeant-at-Arms, O. W. Mayes; Press Secretary, Alex Pringle.

A series of lectures was arranged to be given fortnightly on Saturday evenings, at headquarters, Room 246, Pacific Building, Fourth and Market streets.

Mr. A. R. Thompson gave the first lecture on "Magnetism and Elements of Electricity," Saturday evening, June 13th. Mr. A. J. Theis gave the second lecture on "Primary and Secondary Batteries," June 27th. A cordial invitation is extended to any employee of the Company to attend these lectures.

Manager W. S. Coleman of the Contract Department attended the fifth annual convention of the International Convention of Rotary Clubs at Houston, Texas, this year. When he returned he brought with him the glad news that the

next annual convention will be held in the Exposition City of San Francisco.

Mr. Chas. A. Leonard, of the Electric Distribution Department, and Miss Mary E. Rafferty of Mayfield were joined in happy wedlock on June 19, 1914.

The Industrial Department reports having closed an agreement with the City and County of San Francisco to supply gas for all cooking to be done at the city and county jail. This is one of the biggest cooking equipments and installations on the gas end of "Pacific Service."

In Memoriam

MARY LILLY

It is with regret that we record the death of Mrs. Mary Lilly, wife of Mr. Eugene B. Lilly, Chief Clerk of the Auditing and Accounting Department, San Francisco District.

Mrs. Lilly, whom before her marriage we knew as Miss Mae Quinn, was in charge of the telephone exchange of the company prior to 1906, leaving the service of the company in 1907. All who knew her will remember her charm of manner and her enduring patience. We can well say, "None knew her but to love her, none loved her but to praise." She died in San Francisco on June 29, 1914, after an illness of some months. Besides her husband she leaves a baby girl; the little boy, three years old, died just two weeks before his mother.

The sincere sympathy of "Pacific Service" is extended to both husband and family in their bereavement.

Warning to Voters of California

Proposed Prohibition and Eight-hour Laws are Vicious Measures Which Every Loyal Californian Should Help to Defeat

AT the general election to be held throughout the State of California November 3d next, there will appear upon the ballot two measures that, in my judgment, call for the most serious consideration of the voter. One, a proposed constitutional amendment, generally spoken of as the Prohibition Law; the other, a proposed addition to the Penal Code, is known as the Eight-hour Law. In neither instance are these the result of state legislative enactment, but have gained their place upon the state ballot through the initiative process—by petition of a certain percentage of the registered voters of California. Both, in my judgment, are destructive of the commercial importance of California as a state, and I feel it to be the duty of every loyal Californian to go to the polls on November 3d and help vote them down. For the benefit of those readers of PACIFIC SERVICE MAGAZINE who are not familiar with the terms of these proposed laws I will discuss each briefly. The proposed Eight-hour Law reads as follows:

HOURS OF LABOR.

Any employer who shall require or permit, or who shall suffer or permit any overseer, superintendent, foreman, or other agent of such employer, to require or permit any person in his employ to work more than eight hours in one day, or more than forty-eight hours in one week, except in case of extraordinary emergency caused by fire, flood or danger to life or property, shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not less than \$50 nor more than \$500, or imprisoned in the county jail not less than ten nor more than ninety days, or both so fined and imprisoned.

Should such a law as this go into effect no person in the employ of any other person would be permitted to work more than forty-eight hours in any one week. This would mean that the farmer in gathering his crops, the dairyman in the preparation of his products, and any and all others engaged in pursuits of a seasonal character where, of necessity, the regular hours of labor have to be disregarded at certain seasons of the year, would be so seriously hampered in their occupations as to find them unprofitable by reason of limitation of the hours of labor and the consequent cost of production. The result would be to make the State of California a dumping ground for the markets of the adjoining states, our own industries being practically driven out of business.

Another and most important point that must not be overlooked in considering this measure is the household or domestic

problem. Under such a law as is here proposed no servant would be permitted to work over eight hours a day, and a family would be compelled either to confine all their household work, including the serving of meals, to within that space of eight hours, or subject themselves to the penalties of the law. This, of course, would add to the burdens of housekeeping beyond the limitations of the majority of people employing domestic help.

Following is the text of the proposed Prohibition Law:

Section 26. The manufacture, the sale, the giving away, or the transportation from one point within the state to another point within the state, of intoxicating liquor is prohibited. Any citizen of the state may, in his or her own name, maintain an action of injunction in the county where the violation occurs, to restrain such violation; provided, however, that to any criminal or civil prosecution for violation of this prohibition, it shall be a defense if it be shown that the liquor in question was being manufactured, used, sold, given away, or transported for medicinal, scientific, mechanical or sacramental purposes. The manufacture, sale, giving or transportation of such liquors for medicinal, scientific, mechanical or sacramental purposes shall be regulated by law. Any person violating any provision of this section shall be fined for a first offense not less than one hundred dollars nor more than one thousand dollars and for a second offense shall be fined not less than two hundred dollars nor more than twenty-five hundred dollars and imprisoned in the county jail not less than thirty days nor more than one year; provided, however, that additional penalties may be imposed by law.

Section 27. The transportation into the state of intoxicating liquor, unless it be shown to be for medicinal, scientific, mechanical or sacramental purposes, is prohibited, subject, however, to the laws of the United States relating thereto. Any person violating any provision of this section shall be fined for a first offense not less than one hundred dollars nor more than one thousand dollars and for a second offense shall be fined not less than two hundred dollars nor more than twenty-five hundred dollars and imprisoned in the county jail not less than thirty days nor more than one year; provided, however, that additional penalties may be imposed by law.

If there is one industry more than another with which the State of California has been identified since early times it is the wine industry. Californian wines are celebrated all over the world, and in this industry alone there is an immense sum, amounting to upwards of \$150,000,000 invested. To abolish this industry at one sweep would work serious injury upon the entire State of California. The cosmopolitan character of the people of California has helped to make its name and fame, and the nations of the world, more liberal in their ideas, would find no place for either their homes or their activities in a country so narrow-minded as to prohibit what has been recognized as an established custom since the creation of the world.

I urge upon all employees of this company and upon all the readers of PACIFIC SERVICE MAGAZINE resident in California the serious consideration of these two measures. I ask them to analyze both carefully and, if in their judgment, it is found that serious injury will result to the state by the adoption of either or both, to register their votes in accordance with their judgment at the polls on November 3d.

JOHN A. BRITTON.

San Francisco, July, 1914.

Pacific Service Magazine

PUBLISHED IN THE INTERESTS OF ALL EMPLOYEES OF
THE PACIFIC GAS AND ELECTRIC COMPANY

JOHN A. BRITTON - - - - EDITOR-IN-CHIEF
FREDERICK S. MYRTLE - - - MANAGING EDITOR
A. F. HOCKENBEAUMER - - - BUSINESS MANAGER

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The Pacific Gas and Electric Company desires to serve its patrons in the best possible manner. Any consumer not satisfied with his service will confer a favor upon the management by taking the matter up with the district office.

VOL. VI. JULY, 1914. No. 2

EDITORIAL

In the business houses of today the idea of bringing employer and employee closer together, of binding them, as it were, by ties of mutual interest, is growing more and more in favor. In many corporations plans are being formed to enable employees to become stockholders, and employees' investment companies are being organized, whose members may have the amounts they wish to invest deducted from their weekly pay to be used for buying stock on the exchange.

Two notable instances of the co-operative investment idea are furnished by the Commonwealth Edison Company of Chicago, the Consolidated Gas Company of New York and the New York Edison Company. There is evident everywhere a sincere desire on the part of most employees to become financially interested in the company that employs them, and, in making the realization of this desire possible, the mutual plan such as, for instance, is the underlying principle of most building and loan associations, is generally adopted.

In line with just such a policy is the decision of our Board of Directors to offer an opportunity to all employees of "Pacific Service" to become stockholders by subscribing to the new issue of preferred stock upon the same terms and conditions as have been offered to

the present stockholders. It is a profit-sharing project which the employees are heartily invited to come in under, and it looks like bringing almost immediate results to the fortunate investor in a material advance of the market value of his stock, to say nothing of the advantage which he derives from the opportunity to pay for the stock upon the installment plan, the while it is regularly earning interest for him.

At the recent banquet of Pacific Service Section N. E. L. A., Mr. Britton's announcement of this plan to enable employees of "Pacific Service" to be financially interested in the company was received with much enthusiasm, and at a subsequent meeting of heads of departments, district managers and division superintendents, spontaneous offers of subscriptions, ranging from one share to a hundred, were received, the total registering upwards of one thousand shares. Not bad for a beginning! And the tide is on the flood.

That a franchise under which a light and power company operates in a city is a vested property right, and includes the right to make all extensions of service necessary and in keeping with the city's expansion, has been decided by the Supreme Court of the United States.

The decision in question was rendered in a Californian case, that of *Russell vs. Sebastian*, on April 6th last. The facts and circumstances leading up thereto were these:

Prior to October 10, 1911, every utility that desired to supply a city and its inhabitants with light or water could do so without charge or restriction except the giving of indemnity for damage to the streets. On the date mentioned there went into effect an amendment to the State Constitution whereby cities were given authority to prescribe in their organic laws conditions and regulations under which light, water, power, heat, etc., could be furnished to municipalities; and thereupon the city of Los Angeles

enacted ordinances holding it unlawful for a utility to make excavations in any of the streets without first obtaining permission in writing from the Board of Public Works and, further, providing that no franchise or privilege to lay or maintain pipes or conduits in any of the streets of the city for the transmission of gas, water, heat or steam, could be granted without permission therefor having first been obtained from the city in accordance with such city's charter and ordinances. In a word, the city took the position that the amendment to the Constitution empowered it to forbid the use of the public streets by public service corporations without a special permit to do so.

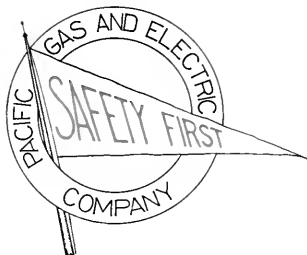
The Economic Gas Company was engaged in laying gas pipes in the streets of the city as a part of its distributing system. It had established itself in the city prior to the amendment to the Constitution and had laid mains and had been supplying gas; from this it claimed a vested right to extend its mains and lay them in streets not before used by it for that purpose, and denied the power of the city government to either take away that right or restrict it under any constitutional amendment adopted after its first rights had been established.

The Supreme Court of the State decided against the company, holding that the city ordinances were valid and enforceable and that the gas company could not extend its system without first complying with such ordinances notwithstanding that their company had established its works prior to the new law taking effect and had built such works with the intent to supply gas to every section of the city and to render sufficient service for that purpose. The case was appealed to the Supreme Court of the United States and in due course the highest legal tribunal of the land reversed the decision of the state court and upheld the gas company's claim. The final decision was written by Mr. Justice Hughes, and we quote from it:

"It was averred, and not denied, that the works of the gas company were established and operated with the intent to furnish gas throughout the city, wherever needed, and that this enterprise had been diligently prosecuted; that a large investment had been made in a plant which was adequate to supply a much greater territory than that reached by the distributing mains when the amendment of 1911 was adopted; that the expense of this installation made it impossible to supply at a profit the limited territory contiguous to the streets then actually occupied by the company; and that if it were confined in its service to that territory it would sustain a constant loss. The company, by its investment, had irrevocably committed itself to the undertaking, and its acceptance of the offer of the right to lay its pipes, so far as necessary to serve the municipality, was complete.

"We conclude that the constitutional amendment of 1911, and the municipal ordinances adopted in pursuance thereof, were ineffectual to impair this right, and that the company was entitled to extend its mains for the purpose of distributing its supply to the inhabitants of the city subject to the conditions set forth in the constitutional provision as it stood before the amendment."

It will be observed that this decision is sweeping, in that it holds that a franchise under which a Californian utility has served a city of that state with either light or water prior to October 10, 1911, is of perpetual duration, cannot be altered, amended, abridged or impaired, and is co-extensive with the boundaries of the city served. The decision gives to each utility so serving a city of California the right to carry on its business and make necessary extensions without being subject to any rent, charge or burden of any kind. It is of the utmost importance to invested capital in California, for the reason that it affords some protection against the machinations of the professional agitator or worse.



“Safety First”—“Fires Last”

A Few Suggestions Whose General Adoption
Seems Worth While

IN the event of fire in any large plant the man in charge should constitute himself a fire chief, and avoid confusion and loss of time by devoting his entire attention to directing his men.

The city fire department, where available, should be called immediately a fire is discovered, irrespective of the magnitude of the fire.

All men in plants should familiarize themselves with the location of fire apparatus, and keep in mind a plan of action in case of fire.

When a generator, motor, or other electrical apparatus takes fire, cut off the current from such apparatus, shut down all revolving machinery, and apply Pyrene, chemical and powder extinguishers, and water from hose lines, in the order named. If current cannot be cut off, use Pyrene first, or get on a safety stand and use the chemicals and hose lines.

If a building is on fire, the first move should be directed toward cutting all electricity from the plant, whether electric station, gas works, warehouse or any other class of building, and then handle the fire as in ordinary cases.

Fires in cable-ways in stations should be overcome with Pyrene and powder extinguishers, or smothered with sawdust and sand. If the fire communicates to the building, cut the station out and apply water.

Oil and gasoline fires should be attacked with Pyrene, chemical and powder extinguishers, or smothered with sawdust and sand. Attack all such fires from the

windward side, if possible. Direct streams from Pyrene and chemical (wet) extinguishers toward one edge of the fire and continue crowding the fire until overcome. Streams thrown into the center of such fires may scatter the fire.

Automobile Fires.—Use Pyrene, chemical and powder extinguishers, sawdust and sand, in order named. Robes, blankets and tarpaulins can also be used to good advantage in smothering such fires.

Pyrene, chemical (wet) and powder extinguishers should be used as a battery, when possible. The loss of a few seconds in getting several on a fire at one time will be made up in effectiveness; quantity being a valuable consideration.

Pyrene extinguishers should be directed into the flames. They can be used safely in breaking an arc; the fluid is a non-conductor, and harmless to any class of apparatus.

Chemical (wet) extinguishers should be directed to the base of the fire or flames, and can be used without harmful effect on any apparatus.

Pyrene and chemical extinguisher fluids, as discharged from the retainers, are absolutely harmless to persons, clothing or other material.

Don't start fighting a fire haphazard. A few seconds expended in cool and deliberate planning will result in an intelligent and sane fight.

Don't put water on an oil or gasoline fire. Water will spread the fire.

Don't hesitate about turning a Pyrene or chemical (wet) extinguisher on a man if his clothing is afire. They will not harm him.

Don't hesitate about using fire apparatus. It is provided for use, and the cost of recharges is insignificant when compared with damage that may result if a fire gets beyond control.

Don't hesitate about wetting electrical machinery, if the fire is of such magnitude that it cannot be overcome with Pyrene, powder extinguishers, sawdust or sand. A wet generator is better than a burned station.

Don't get excited. Numerous cases are of record where glassware has been thrown out of windows onto concrete pavements, while human beings have been left in burning buildings.

Don't forget that a fire may throw many men out of employment.

Don't forget that rubbish and fires are team-mates.

R. J. C.

Our "Pacific Service" Section, N. E. L. A. Bulletin

ERNEST B. PRICE, Editor

The annual meeting of "Pacific Service" Section, N. E. L. A., was held Friday evening, June 19th, in the rooms of the Commercial Club, Merchant Exchange Building, San Francisco. The meeting took the form of a banquet, at which the officers elected at the May meeting were formally installed, and an interesting program of entertainment was provided for the occasion. The following were seated at the speaker's table: Messrs. Chas. L. Barrett, F. A. Leach Jr., C. P. Cutten, P. M. Downing, Dr. David Barrows, dean of the faculty of the University of California, John A. Britton, Stanley V. Walton, A. F. Hockenbeamer, Geo. C. Holberton, Henry Bostwick.

Mr. Stanley Walton presided. A novel feature was introduced at the suggestion of Mr. Geo. C. Holberton in having every one present identify himself by standing and announcing his name and department. Those present numbered one hundred and seventy-five and all branches of the service were represented.

Dr. David Barrows, as guest of honor, spoke in that clear, crisp, businesslike manner so characteristic of him and praised the men whose thoughts have been translated into concrete iron and steel in the upbuilding and development of the State of California. Dr. Barrows also pointed out to the men of "Pacific Service" what a mighty force for good could be built up by right living and high ideals and how this powerful constructive lever could be exerted to upset all destructive thought and forces that are threatening modern civilization.

Mr. John A. Britton, Vice-President and General Manager of "Pacific Service," delivered an address in which he expressed personal appreciation of the

interest taken in the company section of the N. E. L. A. by the employees and voiced a desire that all those present constitute themselves committeemen to bring in new members to the association. During the course of the evening, Mr. Britton contributed his share toward the vocal part of the entertainment, rendering "Then You'll Remember Me" in a clear tenor that has delighted audiences many times and oft. There was plenty of good singing, by the way, at this affair, to which Lee Gilbert, of Engineer Downing's office, was a conspicuous contributor.

Mr. Charles P. Cutten of our legal department and a member of the executive committee of the company section, spoke of the wonderful organization of our company and of its far reaching influence on every industry in the State of California. Mr. Cutten is a very valuable acquisition to the active forces of the company section, and his ability as a speaker, coupled with his grasp of our company's affairs, will prove of great value in the work of the section.

Mr. A. F. Hockenbeamer, Second Vice-President and Treasurer, gave an instructive address on the company's proposed plan of permanent finance, and answered many questions relating thereto. Mr. Hockenbeamer did not anticipate being called upon to speak at the meeting, but rose to the occasion in an extemporaneous address in which he brought out in a forceful manner the many intricacies involved in financing a corporation of the magnitude of the Pacific Gas and Electric Company.

Mr. P. M. Downing, Engineer of Operation and Maintenance, Hydro-Electric Section, outlined the work of the sub-

section meeting for the coming year, and pointed out the many advantages to be obtained by the members taking an active interest in the affairs of the company section.

Mr. Henry Bostwick was called upon by the chairman and in a happy fashion pointed out the general policy to be pursued in connection with the company section, its objects and aims and the reasons why every employee should become identified with the work of the section. In closing, our genial secretary spoke in optimistic terms of the work for the coming year and the great convention of 1915 to be held in San Francisco.

It is hardly necessary to say in closing that our chairman Mr. Stanley V. Walton, makes an ideal toastmaster, and we can look forward to many pleasant and instructive evenings which will be called to order by his gavel.

At the close of the evening all members joined in singing "For He's a Jolly Good Fellow," and the first annual meeting of the company section was reluctantly adjourned at 10:30 o'clock.

N. E. L. A. NOTES.

For the information of our non-members we publish the following excerpt from Mr. Bostwick's general letter of July 2d to the members of the Pacific Service Section:

"Please be advised that the regular monthly meeting of the company section will be held on Friday evening, July 10, 1914, at the National Union Hall, Native Sons' Building, 414 Mason St., San Francisco, and will be called to order promptly at 8 o'clock p. m. The principal speaker for this evening will be Mr. W. J. French, Commissioner of the Industrial Accident Commission of the State of California who will speak on 'Workmen's Compensation and Safety Act.' This is a subject in which all employers as well as all employees are vitally interested and we trust that you will arrange your affairs so as to be

present on this occasion. Our Entertainment Committee also promises something interesting from that quarter.

"In addition to the regular monthly meetings of the section, arrangements have been made for the holding of meetings under the auspices of the several sub-sections viz.:

"Commercial Section, July 24th, L. H. Newbert, Chairman.

"Steam Section, August 28th, F. H. Varney, Chairman.

"Electric Distribution Section, September 25th, S. J. Lisberger, Chairman.

"Auditing Section, October 23d, M. H. Bridges, Chairman.

"Gas Section, November 27th, E. C. Jones, Chairman.

"Hydro-Electric Section, December 23d, P. M. Downing, Chairman.

"In connection with these particular sub-section meetings, the members of the section will be entitled to invite employees of the company who are not members to be present, in order that such employees may be brought in closer touch with the affairs of the N. E. L. A. and the efforts which are being put forth by the company section for the general uplifting of all employees."

Any further comment urging the non-members to become identified with the "Pacific Service" Section of the N. E. L. A. is unnecessary. Subjects of pertinent interest will be taken up at the general meetings, and every up-to-date employee must avail himself of the opportunity to take a broader view of his field of work.

THE N. E. L. A. CONVENTION FOR 1915 WILL BE HELD IN SAN FRANCISCO.

Our two delegates, Mr. Frank H. Varney and Mr. S. J. Lisberger, sent to the N. E. L. A. convention in Philadelphia, have returned bringing back with them the convention prize for 1915.

Messrs. Varney and Lisberger will tell us through the columns of PACIFIC SERVICE MAGAZINE what an N. E. L. A. convention really means.



Lover's Point, Pacific Grove, on the picturesque shores of Monterey Bay.

Items From Women of the Company

This section of PACIFIC SERVICE MAGAZINE is open to any of our women employees who may desire to contribute notes on persons and events. The following have accepted appointment as contributing editors: Miss Letitia A. Curtis, Engineering Department, Hydro-Electric Section; Miss Bertha J. Dale, Auditing Department, San Francisco District.—Editor PACIFIC SERVICE MAGAZINE.

It is at vacation time, mostly, that we give thought to what California has in store for us in the way of natural resources, and then we are permitted to realize that we have everything at our command—mountains, valleys, lakes, rivers, forests, bays, all, in their way, unsurpassable.

In Monterey County, one hundred and twenty-eight miles from San Francisco, is Pacific Grove, a very peaceful town, naturally gifted—an ideal spot for an ideal vacation. Here are many beaches, one in particular, Bathing Beach, being very cozy, well-guarded from the wind by the rocks, so that surf bathing is a delight. The coast along the Pacific Grove side of Monterey Bay is very rocky, but it affords one the opportunity of getting a glimpse of the bottom of the bay without being submerged, because the water is as clear as crystal and through a glass-bottomed boat can be seen a sea-garden of many species of

plants. The variety of shell-fish and sea-animals is so great and they are so easily obtained at low tide that both of our universities have biology schools in this vicinity.

Monterey Bay is noted for its variety of fishes, including the sardine, sea-trout, perch, etc., but greatest of all is the salmon fishing. The fishermen start out from Monterey at about three o'clock every morning and return at different times during the afternoon with boats laden down with salmon running at twenty pounds apiece or over. They receive about four cents a pound for the fish and during the run they must make quite a comfortable amount to keep them through the winter. The present has been a wonderful season. It is told that one fisherman with three boats caught in one day 1900 pounds which brought him about \$76.00 for the day's catch. When the salmon are in the bay great schools of sardines are found, as they

are driven in by the salmon. Then, too, during the salmon run it is a common sight to see the spouts of many whales, and also often one sees at a distance a fight to death between a whale and swordfish. The whales, though, do not molest the fishing boats.

From Pacific Grove it is a short walk to Point Pinos Light-house, which is high on the bank overlooking the ocean. There is also a pleasant walk through the woods of pine to Moss Beach, which, too, is along the ocean, and here are banks and banks of sand, so clear and white that they resemble banks of snow thirty to forty feet high. Another trip is to Seaside, where there is a wonderful live oak tree, which is considered one of the largest live oaks in the world.

Starting out from Monterey it is about a three-mile walk to Carmel-by-the-Sea. Here the deep blue of the ocean, the very white sand, the dark green background of the pine trees, appeal to the artistic eye. Surf bathing is the main sport here. Returning to Monterey, we find the first wooden building, the first brick building, the first theater and the first capital of California. Monterey is an exceedingly interesting town and is also one of the first places reached by the missionaries, San Carlos de Monterey being founded by Father Junipero Serra in 1770, to whom there is a monument erected in Monterey. Around some of the old missions there remains portions of forts built by the fathers during warlike times, in their endeavors to convert the Indians.

It is a most interesting country, all around, and no one should neglect the opportunity to pay it a visit. L. A. C.

Miss Effie M. Brandt, of the General Manager's office, and Miss Grace Brandt, of the Land Department, are spending a very enjoyable vacation on the Coquille River, Oregon.

Miss Julia Small, of the Appliance Department, is spending her vacation at Anderson Springs, Lake County.

On June 10th, at Trinity Presbyterian Church, San Francisco, Mr. Roy P. Lutzi, of the Electric Distribution Department, was married to Miss Annie L. Girdwood of San Francisco.

They were presented with a cut glass berry set by Mr. Lutzi's office associates. The good wishes of "Pacific Service" are extended to the young couple.

Announcement has reached us of the engagement of Miss Rena Willcox of the Bookkeeping Department, San Francisco District, to Mr. Chas. B. Stone of the Collection Department.

Mr. Richard Hunt of the Purchasing Department and Miss Helen Hunt of the Addressograph Department, San Francisco District, quietly stole a march on all their friends and were married on Sunday, June 7, 1914. We understand the young couple are spending their honeymoon in the Shasta region.

Mr. C. W. Morris of the Head Auditing Department was married on Tuesday, June 16, 1914, to Miss Ruth Olson. After a trip through the south, Mr. and Mrs. Morris will reside in San Francisco.

A number of the young ladies of the San Francisco District have formed a sewing club, known as "Theta Nu," and during the past few months have had some jolly evenings. The following have entertained since the club was organized: Misses Elizabeth Gleeson, Mazie Hurley, Florence MacDonald, Sarah Ober, Bertie Dale, Phoebe Willeox, Loretta Vander White, Margaret Murphy and Laura Gleeson.

Swimming parties and outings have been planned and the first outing was a trip to Boyes Springs on Sunday, June 14th. The party left San Francisco on the 7:15 a. m. boat and spent a delightful day motoring, swimming, etc., lunching at the cottage of Mr. and Mrs. Hurley at Boyes.

From Santa Rosa comes news of the engagement of Miss Marian Abrahams stenographer in the employ of District Manager M. G. Hall, to Mr. Franklin W. Young, of San Francisco.

Miss Abrahams came to this country some years ago from Australia. Her charming personality and pleasing ways have won her a host of friends. She has a fine voice and has been heard frequently at social and fraternal gatherings, and she has taken an active part in choral work during her stay in Santa Rosa. The bridegroom-elect is a young pharmacist of San Francisco.

The employees of the Sacramento District enjoyed a jolly picnic under the oaks along the Cosumnes River on Decoration day. The trip was made in the company's large auto truck. After partaking of a fine spread under the "chestnut" tree, dancing and other amusements were indulged in. Captain Baldwin succeeded in winning the "fat man" race, but we will not mention who won the race on the ladies' side.

A jolly time is anticipated in the near future by the employees of the Sacramento District when a trip will be made up the river some moonlight night. A barge will be secured and towed up the river where dancing and other amusements will take place.

A new "patrolman" made his appearance at the home of James Nickless recently. Mr. Nickless, who is the Sacramento Power Division patrolman, says the boy is trying to put on a pair of climbers already.

The Sacramento Power Division baseball team is showing marked improvement in every game. They would like very much to show the Pacific Gas and Electric boys around the bay how to play the national game. No doubt arrangements will soon be made to have one of the city teams make a journey

on the boat some Saturday night and cross bats with them on Sunday afternoon.

Mrs. Nell Davis Walker has resigned her position with the company on account of ill health. She was one of the most popular clerks in the Sacramento District and will be missed very much.

The marriage of Miss Leona May Kipp and Mr. Ward Leroy Booth, first operator at Station "B," Sacramento, recently took place, and they are receiving the congratulations of their many friends.

Mr. C. F. Dixon, first operator at Station "A," Sacramento, accompanied by Mrs. Dixon, recently enjoyed a week's outing in the vicinity of Drum.

Mr. and Mrs. Frank Breuner, newlyweds, are now located in their new home at 710 E street, where they are receiving the congratulations of their many friends.

These are all from Oakland:

Mr. A. P. Parratt, auditor of the Oakland office, spent his vacation on a fishing trip to the Big Basin, Santa Cruz County.

Mr. T. W. Hawley left on July 4th for his annual outing at Blue Lakes.

Miss Marie Taylor spent the Fourth visiting friends in Fresno.

Mrs. D. M. West, telephone operator, spent the week end at Monterey and Santa Cruz.

Mr. Frank Gilbert, of the Commercial Department, spent his vacation at Mt. Herman, Santa Cruz Mountains.

Mr. R. O. Adams, of the Commercial Department, and family spent their vacation at Healdsburg.

Miss M. Adamson, of the Cashier's office, has left for a two weeks' outing at the Yosemite.

Miss Zella Stewart, of the Billing Department, is spending a three weeks' vacation in the Yosemite Valley.

PACIFIC GAS AND ELECTRIC COMPANY

DIRECTORS

F. B. ANDERSON
HENRY E. BOTHIN
JOHN A. BRITTON
W. H. CROCKER
F. G. DRUM

JOHN S. DRUM
F. T. ELSEY
D. H. FOOTE
J. E. GLADSTONE
W. G. HENSHAW

A. F. HOCKENBEAUMER
SAMUEL INSULL
JOHN D. MCKEE
C. O. G. MILLER
GEORGE K. WEEKS

OFFICERS

F. G. DRUM.....President
JOHN A. BRITTON.....Vice-Pres. and Gen. Mgr.
A. F. HOCKENBEAUMER.....Second Vice-Pres. and Treas.
J. E. GLADSTONE.....Third Vice-President

D. H. FOOTE.....Secretary and Asst. Treasurer
JOS. C. LOVE.....Asst. Treasurer
CHAS. L. BARRETT.....Asst. Secretary
M. K. PARKER.....Asst. Secretary

HEADS OF DEPARTMENTS

M. H. BRIDGES.....Auditor
W. H. KLINE.....General Agent
R. J. CANTRELL.....Property Agent
GEORGE C. ROBB.....Supt. of Supplies
J. H. HUNT.....Purchasing Agent
E. B. HENLEY.....Manager Land Dept.
J. P. COGHLIN.....Manager Claims Dept.
H. BOSTWICK.....Secretary to President
F. S. MYRTLE.....Manager Publicity Dept.
L. H. NEWBERT.....Manager Appliance Dept.
G. C. HOLBERTON.....Chief Engr's Stockton Water Dist.

W. B. BOSLEY.....Attorney
H. C. VENSANO.....Civil Engineer
E. C. JONES.....Engr. Gas Dept.
H. P. PITTS.....Industrial Engineer
S. V. WALTON.....Manager Commercial Dept.
S. J. LISBERGER.....Engr. Electric Distribution
SHERWOOD GROVER.....Asst. Engr. Gas Department
J. P. JOLLYMAN.....Engr. of Electric Construction
P. M. DOWNING.....Engr. O. & M. Hyd.-Elec. Sect.
C. J. WILSON.....Asst. Engr. Electric Distribution
F. H. VARNEY.....Engr. O. & M. Steam Section
F. G. BAUM.....Chief Engineer Hydro-Electric Dept.

DISTRICT MANAGERS

District	Headquarters	Manager
ALAMEDA CO.		
BERKELEY	Oakland	F. A. LEACH, JR.
OAKLAND		
CHICO	Chico	H. B. HERYFORD
COLUSA	Colusa	L. H. HARTSOCK
CONTRA COSTA	Martinez	Don C. RAY
FRESNO	Fresno	M. L. NEELY
GRASS VALLEY	Grass Valley	JOHN WERRY
MARYSVILLE	Marysville	J. E. POINGESTRE
MARIN	San Rafael	W. H. FOSTER
NAPA	Napa	O. E. CLARK
WOODLAND	Woodland	

District	Headquarters	Manager
NEVADA CITY	Nevada City	JOHN WERRY
PETALUMA	Petaluma	H. WEDEB
PLACER	East Auburn	H. M. COOPER
REDWOOD	Redwood City	E. W. FLORENCE
SACRAMENTO	Sacramento	C. W. McKEILLIP
SAN FRANCISCO	San Francisco	G. C. HOLBERTON
SAN JOSE	San Jose	J. D. KUSTER
SANTA ROSA	Santa Rosa	M. G. HALL
SOLANO	Dixon	C. E. SEBOWICK
STANISLAUS	Newman	W. A. WIDENMANN
VALLEJO	Vallejo	A. J. STEPHENS
		W. E. OSBORN

MANAGERS OF WATER DISTRICTS

NEVADA (Nevada City).....GEORGE SCARFE
PLACER (East Auburn).....H. M. COOPER

STANDARD (Electra).....W. E. ESKEW
STOCKTON (Stockton).....J. W. HALL

SUPERINTENDENTS OF POWER DIVISIONS

COLGATE.....MILES WERRY
DE SABLE.....I. B. ADAMS
DRUM.....JAMES MARTIN
ELECTRA.....W. E. ESKEW
MARYSVILLE.....E. C. JOHNSON
NEVADA.....GEORGE SCARFE
SOLANO.....J. W. COONS

NORTH TOWER.....C. D. CLARK
OAKLAND.....WILLIAM HUGHES
SACRAMENTO.....J. O. TOHEY
SAN JOSE.....F. G. MAYNARD
SOUTH TOWER.....A. H. BURNETT
STOCKTON.....E. C. MONAHAN

SUPERINTENDENTS OF STEAM ELECTRIC STATIONS

H. N. MOSHER.....Chief Engr. Station "C," Oakland
J. W. VARNEY.....Supt. of Substations, San Francisco

SUPERINTENDENTS OF ELECTRIC DISTRIBUTION

BERKELEY.....J. H. PAPE
OAKLAND (Underground).....R. C. POWELL
OAKLAND AND ALAMEDA (Overhead).....A. U. BRANDT
MARIN

SACRAMENTO.....C. R. GILL
SAN FRANCISCO.....A. B. THOMPSON
SAN JOSE.....A. C. RAMSTAD
CHAS. DALLHUP

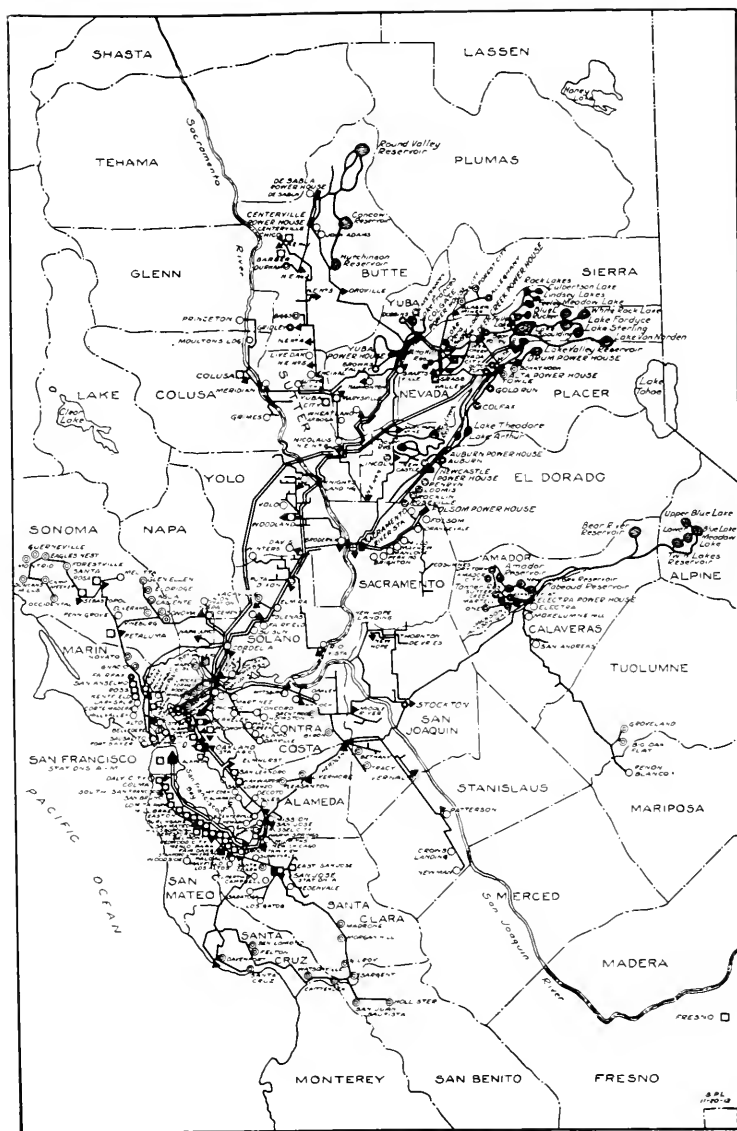
SUPERINTENDENTS OF GAS WORKS

OAKLAND.....A. C. BECK
SACRAMENTO.....EDWARD S. JONES
FRESNO

SAN FRANCISCO.....DENNIS J. LUCY
SAN JOSE.....R. H. HADDOCK
PAUL C. FENK

SUPERINTENDENTS OF GAS DISTRIBUTION

OAKLAND.....GEORGE KIRK
SUPERINTENDENT OF RAILWAY DEPARTMENT.....N. J. HULLIN



PACIFIC GAS AND ELECTRIC COMPANY

CITIES AND TOWNS SUPPLIED WITH GAS,
ELECTRICITY, WATER AND RAILWAY

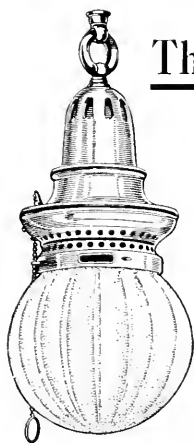
SERVICE FURNISHED	NUMBER OF CITIES AND TOWNS SERVED BY COMPANY			TOTAL POPULATION
	DIRECTLY	INDIRECTLY	TOTAL	
Electricity.....	152	62	214	1,221,123
Gas.....	49	2	51	1,124,893
Water (Domestic).....	14	14	28	58,905
Railway.....	1		1	75,602

Place	Population	Place	Population	Place	Population
¹ Alta.....	20	¹ Forestville.....	100	¹ Palo Alto.....	6,300
¹ Alameda.....	27,000	¹ Felton.....	300	¹ Pacheco.....	200
¹ Alamo.....	50	¹ Fresno.....	40,000	¹ Penryn.....	250
¹ Albany.....	800	¹ Galson.....	1,800	¹ Patterson.....	500
¹ Amador City.....	200	¹ Gilroy.....	2,000	¹ Penn Grove.....	300
¹ Adams Joho.....	25	¹ Glen Ellen.....	500	¹ Perkins.....	50
¹ Alleghany.....	200	¹ Gold Run.....	100	¹ Petaluma.....	5,500
¹ Alto.....	25	¹ Grass Valley.....	4,500	¹ Piedmont.....	1,720
¹ Alviso.....	200	¹ Gridley.....	1,800	¹ Pike City.....	200
¹ Angel Island.....	280	¹ Grimes.....	250	¹ Piole.....	1,500
¹ Atterton.....	250	¹ Groveland.....	125	¹ Pittsburg.....	2,372
¹ Auburn.....	2,375	¹ Guerneville.....	500	¹ Pleasanton.....	2,000
¹ Agua Caliente.....	100	¹ Hammonton.....	500	¹ Point San Pedro.....	30
¹ Alvarado.....	900	¹ Hayward.....	4,000	¹ Port Costa.....	600
¹ Antioch.....	3,000	¹ Hillsborough.....	1,000	¹ Redwood City.....	3,200
¹ Arboga.....	100	¹ Hollister.....	3,000	¹ Richmond.....	10,000
¹ Barber.....	500	¹ Hookston.....	75	¹ Rio Vista.....	884
¹ Belmont.....	350	¹ Ignacio.....	100	¹ Rocklin.....	1,000
¹ Bea Lomond.....	800	¹ Imoe.....	900	¹ Roseville.....	2,600
¹ Belvedere.....	1,000	¹ Irvine.....	1,000	¹ Rodeo.....	500
¹ Benicia.....	3,360	¹ Jackson Gate.....	100	¹ Ross.....	500
¹ Berensford.....	25	¹ Jackson.....	2,035	¹ Russell City.....	250
¹ Berkeley.....	53,000	¹ Kennedy Flat.....	20	¹ Sacramento.....	75,602
¹ Bethany.....	200	¹ Kentfield.....	250	¹ San Andreas.....	200
¹ Biggs.....	750	¹ Knights Landing.....	350	¹ San Anselmo.....	1,500
¹ Big Oak Flat.....	20	¹ Knighten.....	125	¹ San Bruno.....	1,500
¹ Brenwood.....	200	¹ Lake Francis.....	5	¹ San Carlos.....	100
¹ Brighton.....	100	¹ Lafayette.....	100	¹ San Francisco.....	530,000
¹ Broderick.....	200	¹ Lathrop.....	300	¹ San Jose.....	37,946
¹ Brown's Valley.....	50	¹ Live Oak.....	200	¹ San Leandro.....	4,000
¹ Byron.....	200	¹ Livermore.....	2,250	¹ San Lorenzo.....	100
¹ Burlingame.....	4,300	¹ Los Gatos.....	3,000	¹ San Mateo.....	6,500
¹ California City.....	25	¹ Larkspur.....	600	¹ San Quentin.....	2,500
¹ Camp Meeker.....	200	¹ Larkspur.....	1,400	¹ San Rafael.....	6,000
¹ Campbell.....	600	¹ Lomita Park.....	100	¹ San Ramon.....	25
¹ Centerville.....	1,000	¹ Los Altos.....	500	¹ San Pablo.....	1,000
¹ Centerville.....	20	¹ Loomis.....	400	¹ Santa Clara.....	6,000
¹ Chico.....	13,000	¹ Madison.....	250	¹ Santa Cruz.....	16,000
¹ Collinsville.....	150	¹ Madrone.....	125	¹ Saratoga.....	50
¹ Colma.....	3,500	¹ Maletta.....	30	¹ Santa Rosa.....	10,500
¹ Colusa.....	1,500	¹ Manlove.....	50	¹ Sebastopol.....	1,200
¹ Concord.....	1,500	¹ Martinez.....	5,000	¹ Sausalito.....	2,500
¹ Consumnes.....	50	¹ Martell.....	150	¹ Sheridan.....	130
¹ Cornet.....	1,500	¹ Marysville.....	7,000	¹ Smartsville.....	500
¹ Cotfax.....	50	¹ Mayfield.....	1,500	¹ South San Francisco.....	2,500
¹ Cordelia.....	150	¹ Mayhew.....	50	¹ Stanford University.....	2,600
¹ Corte Madera.....	350	¹ Menlo Park.....	1,500	¹ Sonoma.....	1,200
¹ Crockett.....	2,500	¹ Meridian.....	300	¹ Stege.....	1,000
¹ Crow's Landing.....	375	¹ Millbrae.....	300	¹ Stockton.....	35,000
¹ Cupertino.....	50	¹ Mills.....	50	¹ Suisun.....	1,200
¹ Daly City.....	250	¹ Milpitas.....	300	¹ Sutter City.....	150
¹ Danville.....	250	¹ Mill Valley.....	2,500	¹ Sutter Creek.....	1,500
¹ Davis.....	750	¹ Mission San Jose.....	500	¹ Sunnyvale.....	1,500
¹ Decoto.....	350	¹ Mokelumne Hill.....	150	¹ Tiburon.....	400
¹ de Saba.....	25	¹ Monte Rio.....	50	¹ Torrey.....	20
¹ Dixon.....	1,000	¹ Morgan Hill.....	500	¹ Towle.....	100
¹ Dobbins.....	50	¹ Moulton's Landing.....	30	¹ Tracy.....	1,200
¹ Davenport.....	1,000	¹ Mountain View.....	2,500	¹ Union Station.....	40
¹ Drytown.....	20	¹ Mt Eden.....	200	¹ Vacaville.....	1,200
¹ Durham.....	500	¹ Mar Island.....	500	¹ Vallejo.....	15,600
¹ Dutch Flat.....	500	¹ Napa.....	7,500	¹ Vineburg.....	200
¹ Duncan's Mills.....	150	¹ Nevada City.....	2,700	¹ Walnut Creek.....	350
¹ Eagle's Nest.....	50	¹ New Chicago.....	10	¹ Warm Springs.....	200
¹ Easton.....	300	¹ Newark.....	700	¹ Watsonville.....	4,500
¹ Edensvale.....	500	¹ Newcastle.....	750	¹ Wheatland.....	1,400
¹ Edwards.....	500	¹ Newman.....	1,400	¹ Wintera.....	1,200
¹ Elmira.....	150	¹ Niles.....	800	¹ Woodland.....	3,200
¹ El Verano.....	400	¹ Nicolais.....	75	¹ Woodside.....	200
¹ Electra.....	5,000	¹ Novato.....	250	¹ Yolo.....	400
¹ Emeryville.....	100	¹ Oakland.....	215,000	¹ Yuba City.....	1,200
¹ Encinal.....	100	¹ Oakley.....	80		
¹ Fairfax.....	500	¹ Occidental.....	400	Total.....	1,288,123
¹ Fairfield.....	834	¹ Orange Vale.....	100		

¹Unmarked—Electricity only.²Gas only.³Gas and Electricity.⁴Gas, Electricity and Water.⁵Gas, Electricity and Street Railways.¹—Electricity and Water.²—Electricity supplied through other companies.³—Gas supplied through other companies.⁴—Water supplied through other companies.

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OPERATES 10 hydro-electric plants in the mountains.
4 steam-driven electric plants in big cities.
17 gas works.

SERVES ¹ of California's population.
² of California's 58 counties.
An area of 37,775 square miles.
³ the size of New York State.
⁴ the size of all the New England States combined.



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Humphrey "20" Double Standard Mantle Lamp

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Consumes eight to nine cubic feet of gas per hour.

General Gas Light Company

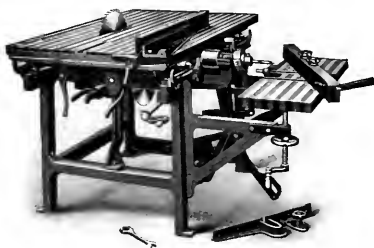
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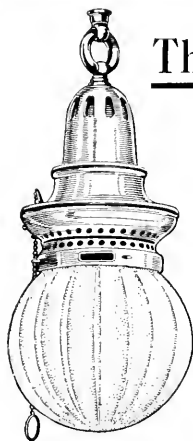
PACIFIC SERVICE MAGAZINE



AUGUST • 1914

No.
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Published Monthly by the Pacific Gas and Electric Co., San Francisco, Cal.



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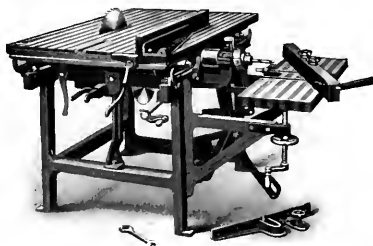
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PACIFIC SERVICE MAGAZINE



Vol.
6

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The Pacific Telephone and Telegraph Company

GOOD SERVICE AT FAIR RATES

Reports

Construction

Designs

J. G. White Engineering Corporation

ALASKA COMMERCIAL BUILDING
SAN FRANCISCO

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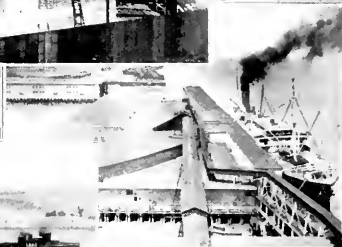
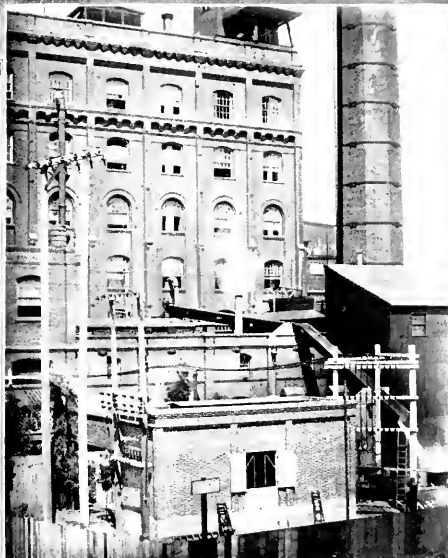
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Contents for August

THE GREAT FACTORY ON CARQUINEZ STRAITS	<i>Frontispiece</i>
ONE OF CALIFORNIA'S LEADING INDUSTRIES; THE GREAT PLANT OF THE CALIFORNIA AND HAWAIIAN SUGAR REFINING COMPANY AT CROCKETT	75
THE OFFICE BOY SAYS	83
THE DEVELOPMENT OF A SIMPLE AUTOMATIC PUMPING PLANT FOR DOMESTIC SERVICE	<i>C. E. Sedgwick</i> . 84
SOME TELLING POINTS AGAINST THE UNIVERSAL EIGHT-HOUR LAW	86
"PACIFIC SERVICE" EXTENDS ITS PROFIT-SHARING OFFER TO ITS CONSUMERS	88
TIDINGS FROM TERRITORIAL DISTRICTS	90
ITEMS FROM WOMEN OF THE COMPANY	98
EDITORIAL	100
OUR "PACIFIC SERVICE" SECTION, N. E. L. A. BULLETIN	<i>E. B. Price</i> . 102
GATHERING OF THE CLANS AT PHILADELPHIA	<i>S. J. Lisberger</i> . 101
THE SUPERINTENDENT'S PLACE IN "SAFETY FIRST"	<i>J. P. C.</i> . 106
GETTING READY FOR "1915"	<i>T. E. Fogalsung</i> . 108
DIRECTORY OF COMPANY'S OFFICIALS	i
MAP OF COMPANY'S SYSTEM	ii
CITIES AND TOWNS SUPPLIED BY "PACIFIC SERVICE".	iii

Index to Advertisers

Allis Chalmers Mfg. Co.	vi	Pierson, Roeding & Co.	xviii
Associated Oil Co.	v	Remington Typewriter Co.	xvii
Byron Jackson Iron Works.	ix	Roedling's, John A., Sons Co.	xvii
Chaplin-Fulton Mfg. Co.	ix	Schaw-Bulcher Co.	x
General Electric Co.	xi	Sprague Meter Co.	x
General Gas Light Co.	iv	Standard Underground Cable Co.	ix
Halsey, N. W., & Co.	11th page cover	Steiger & Kerr Stove & Foundry Co.	xviii
Harron, Rickard & McCone.	iv	Western Engineering Publishing Co.	x
Johns-Manville, H. W., Co.	vii	Westinghouse Electric & Mfg. Co.	2d page cover
Mark-Lilly Co.	xii	White, J. G., Engineering Corporation	2d page cover
Pacific Telephone & Telegraph Co.	2d page cover	Wood, H. D., & Co.	xvii
Patrick & Co.	x		
Pelton Water Wheel Co.	x		



Views of the great plant of the California and Hawaiian Sugar Refining Company at Crockett, on the Straits of Carquinez. The topmost view is of the new concrete storage warehouse, capacity 30,000 tons. Next in order is seen the great seven-story factory, where the raw sugar goes through the refining process. In front is the new transformer-house, which connects with "Pacific Service." The remaining views explain themselves.

One of California's Leading Industries; the Great Plant of the California and Hawaiian Sugar Refining Company at Crockett

In the following descriptive article, with its accompanying illustrations, our readers are afforded an insight into a prominent branch of California's industrial development. As is the case with about every class of industry in progress within the territory covered by its system, "Pacific Service" plays a part in the process of sugar-refining and, as will be seen from this description of the California and Hawaiian Company's plant, in fashion beneficial to the industry.—Editor PACIFIC SERVICE MAGAZINE.

ON the Straits of Carquinez, adjacent to the point where the Southern Pacific Overland permits itself to be ferried across San Francisco Bay, stand the factory and warehouses of the California and Hawaiian Sugar Refining Company. Together they present an imposing figure, taking up, as they do, an area of about eight acres between the railroad tracks and the waterfront at Crockett, which, as everyone knows, lies just below Port Costa and, as all who are in-

terested in "Pacific Service" know, marks the point where the giant cables, stretched between our North and South towers, span the bay.

Here the hum of industry is never-ceasing. Day in, day out, by night and by day, the great factory grinds on, while the accompanying stretch of warehouses and wharves ever presents a busy spectacle. To and from this point great steamers from the Islands ply continuously, for here the raw cane-sugar that



Bird's-eye view of the California and Hawaiian Sugar Refining Company's factory, warehouses and wharves at Crockett, on the Straits of Carquinez.

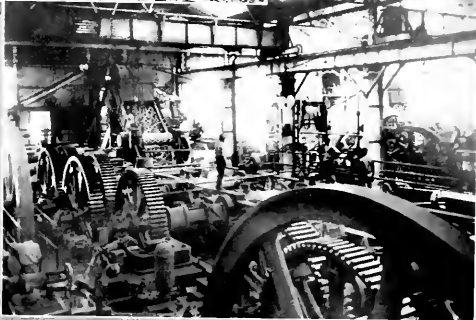
is the chief product of our tropical neighbor is converted into the pure, white commodity that graces the Californian breakfast table. Sugar-refining here represents, if not entirely a Californian, at least a Western industry, and so a few notes of descriptive character concerning this particular development may not come amiss at this time, when the eyes of the entire civilized world are centered upon our Golden State



men. During the past year the company has made very extensive enlargements, and an idea of the capacity of its factory is

and its resources.

The California and Hawaiian Sugar Refining Company employs at its Crockett plant in the neighborhood of 600 men on its regular staff, and when steamers are in from the Hawaiian Islands discharging sugar the force is increased at times to 1000



Where the sugar comes from. An Hawaiian cane-field in bloom. Harvesting the sugar-cane. Crushing the cane in plantation mill.

afforded by the information that it is today in a position to melt 2,000,000 pounds of raw sugar in every twenty-four hours.

The steamers delivering raw sugar to this plant represent the latest skill in the shipbuilding trade, and cargoes of 13,000 tons capacity have been discharged at the company's wharves. The facilities for discharging and receiving the sugar are excellent, inasmuch as 2500 tons are

The refining process, briefly described, consists of washing the superficial impurities off the outside of the raw sugar grains, melting the resultant sugar and filtering it, first through finely-woven cotton bags and then through bone char. This filtration changes the liquor from a light brown or straw color to a pure white; that is, it makes it transparent like plate-glass. After the filtration is complete, the white liquor is drawn into

large vacuum pans where the surplus moisture is driven from the liquor by boiling at a low temperature with the aid of vacuum, and when the mass has reached the consistency of half-formed ice or thick oatmeal mush, it is dropped from the pans



discharged from one ship in nine hours' time.

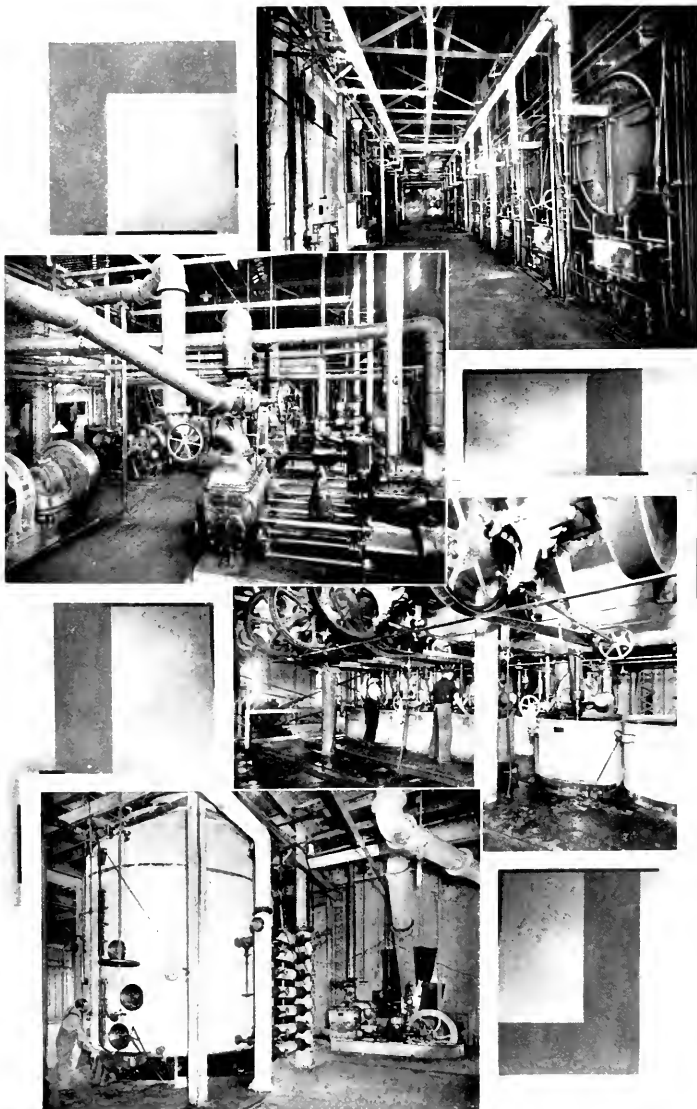
The sugar, up to the daily melting capacity, is placed directly on conveyors and sent in to the refinery proper, where it is handled most expeditiously with the aid of the latest labor-saving and scientific machinery known in the refining business. Raw sugar is delivered to the refinery ninety-six per cent pure, and it is the refiner's business to extract the remaining four per cent of foreign matter and turn out to the consuming public the beautiful, white crystallized grains of sugar with which we are all familiar. There is probably no food article for sale in the markets of this country today that is as pure as is sugar.



Exterior and interior views of the company's new concrete storage warehouse; capacity 30,000 tons. Interior view shows 25,000 tons in storage.

into centrifugal machines directly underneath which revolve at the rate of 1000 revolutions per minute. The centrifugals throw off the remaining liquor that surrounds the crystals as they are dropped from the pan, leaving the sugar in the centrifugals in granulated form, but still containing a certain amount of moisture.

From the centrifugals, the sugar is



Views of the interior of the sugar factory. Reading downward, these are: Boiler room; auxiliary pump room; centrifugal station; new vacuum pan, capacity fifty tons of sugar every two hours.

sent through large revolving drums, through which is drawn a strong current of very hot air which takes out the last of the moisture in the sugar, delivering the dry grains to the packing room with not more than three one-hundredths of one per cent of moisture. In the packing-room, the sugar is sent over screening devices which eliminate any lumps that may have been formed in the centrifugals, also eliminating any dust that may have accumulated after the sugar is dried, and, at the same time, sort the grains according to size to meet the market demand. These grains are then packed in various kinds and sizes of containers, from 2-lb. cotton bags and 2-lb. cartons to 100-lb. bags and 350-lb. barrels.

The small package machines for putting up the 2-lb., 5-lb., 10-lb. and 25-lb. packages seem to be endowed with almost human intelligence. Two operators will fill, weigh, sew and deliver, ready for the market, thirty packages a minute of the smaller sizes, and the weight will not vary one-sixteenth of an ounce from absolute correctness.

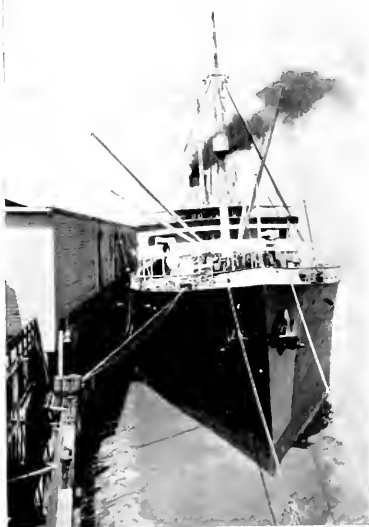
The warehouses at the plant of the California and Hawaiian Sugar Refining Company are very extensive, as all the raw sugar is received during a period of nine months, while the refinery is operated during the entire year. At times there is as much as 60,000 tons of sugar stored at Crockett, representing conservatively a value of \$1,200,000.

The natural point of interest to the

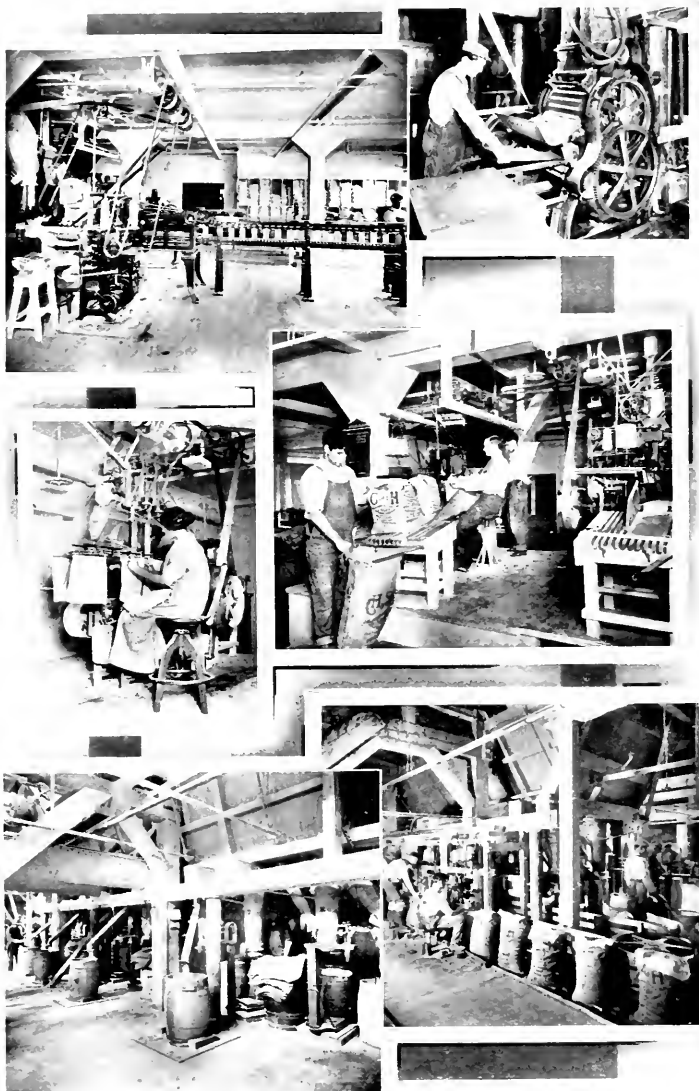
casual visitor, however, when he has done admiring the immense warehouses and the wharves along which they run, is the big seven-story factory that is operating night and day, without cessation, practically 365 days in the year. The refinery proper contains an immense amount of machinery on every floor from basement to roof. This one building alone covers a ground area of 300 feet in length by 200 feet in width, and is

only one of a group of many buildings which comprise the whole plant. The area covered by all the buildings represents about eight acres, and information is given out that the improvements which have just been completed are but the beginning of a series of enlargements that will ultimately make the refinery at Crockett one of the largest, if not the very largest, in the world. Plans that are at present drawn, of which the recent enlargements are a part, contemplate a refinery with a melting capacity of 4,000,000 pounds of sugar per day.

A few years ago this plant was operated entirely by steam-driven machinery, or by motors which received their current from generators driven by steam machinery in the plant of the sugar refinery. Five years ago the management decided to try "Pacific Service," stating at the time that it was absolutely necessary to have continuous power, that being one of the essentials and a more important one than any other connected with the purchase of outside power. The



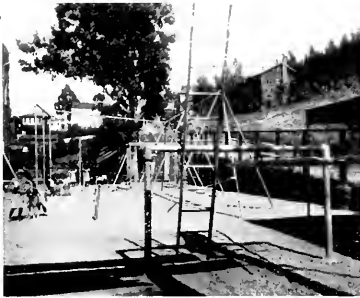
Matson liner discharging raw-sugar cargo at Crockett.



Interior of the factory. Reading downward from the top, right to left: Cube machine; small package room; putting up small bags; automatic small-bag machine; sewing filled sacks by machinery; packing room, where sugar is placed in containers.

company tried "Pacific Service" in a small way for a year, installing at the time a set of three 75 k.v.a. transformers. About two years later, being well satisfied with the experiment and the service rendered, it installed a second set of three transformers, of 150 k.v.a. each, to work in conjunction with the first set installed. The service since the installation of the second set of transformers has been so very satisfactory that the company has decided it can afford to operate its plant with "Pacific Service" without fear of interruption to its business, and to that end, and instead of installing steam machinery to generate power for its own use, it has just installed a new substation containing four 500 k. v. a. transformers, and will hereafter purchase practically all the power it requires for driving machinery from "Pacific Service." These transformers are located on the north side of the Southern Pacific railroad tracks, and are connected to our South Tower station by two sets of leads, which leads cross the railroad tracks on a high double pole-line, a piece of work which does credit to the engineers responsible for its construction.

This new substation, which has been installed under the direction of our engineers from drawings prepared by them, is one that the sugar company may be proud of. The refinery at Crockett is different in one respect from almost any other manufac-



Children's play-ground at Crockett.

power in that it is necessary for it to operate a large battery of boilers, and at the present time the boiler capacity of the plant is in excess of 5500 h.p., and the steam generated therefrom has been and will be used, in the future, for the boiling of the sugar liquors, evaporation of the moisture from these liquors and the drying of the sugar, none of which can be accomplished by electricity. The management announces, however, that hereafter all the power-driven apparatus in the refinery will be operated by "Pacific Service" power.

The illustrations accompanying this article will give the reader a fair idea of the methods used in applying electricity for the driving of sugar-house machinery.

The California and Hawaiian Sugar Refining Company operates its plant on the basis of three shifts of eight hours each, it being the first refinery in the United States to inaugurate this system. The company has also done a great deal to improve civic conditions in the town of Crockett, where its factory is located, having constructed new streets, put in sewers, beautiful parks, children's play-

grounds, an athletic field and a splendid well-equipped clubhouse, which is operated under the auspices of the Y. M. C. A. It has also installed sanitary drinking fountains on various street corners, and has taken a pride in cleaning up all vacant property which it owns



Company's bungalow at Crockett.

in the vicinity of the town, planting these vacant places with flowers and shade trees. In addition, it is just about to let a contract for the building of a large gymnasium, which will be equipped with the latest athletic apparatus, bowling alleys, handball courts, reading and study rooms, and last, but not by any means least, a large swimming pool.

The company also operates the largest hotel in Crockett, and, strange to say, the company hotel is the most popular in the community. It is very seldom that a room is available for the transient guest. The policy of the company, however, has been rather peculiar in this respect, as it has refused to employ people at its works merely because they stopped at the company hotel. A prospective employee has a very much better chance of securing employment if he stops at some hotel other than the company's. After securing his position, however, he may change to the company's hotel, if he so elects.

The company adopts a very liberal policy in connection with the hotel, as any profit made in conducting it is immediately reinvested in the hotel property for the benefit and comfort of the guests stopping there. It is really a very attractive place, with its large lobby, comfortable seats, 24-hour grill room service, clean rooms, extensive tub and shower bath equipment, commodious dining-rooms and good meals. The gardens surrounding the hotel would do credit to a hotel located at one of our seaside resorts or in a much more populous place. An employee of the company or any person living in Crockett can secure board and lodging at this hotel for the sum of \$28.00 per month.

"Safety First" is also a motto of this institution. Several years ago, before the present compensation bill went into effect, the sugar company had safety engineers inspect its plant, and it carried out all the recommendations then made. When the inspectors for the state visited this plant since the first of this year,

they found very little left to be done, and the report made was very favorable. Accidents have been reduced to a minimum.

There has been formed, also, among the employees of the company a "Safety Commission," which meets regularly and makes recommendations to the management from time to time as to additional safety devices that should be installed. This commission holds meetings similar to a board of directors, and its members are paid a fee for each meeting attended. The results of the commission's work have been very gratifying indeed.

Another good idea that is carried out at this plant is the Suggestion Bureau. Paper, envelopes and cards soliciting suggestions are placed at convenient points throughout the factory, and all suggestions that are practicable and carried out result in compensation to the employee submitting them in proportion to the value of a suggestion.

Fire protection is another point that is well looked after. The company has all of its men trained for special duty in case of fire, and drills are held at least once a month. Weekly reports showing the condition of all apparatus and stating that it has been tested are in vogue. The Gamewell fire alarm system is installed at the plant, and the company has voluntarily donated boxes and run the fire lines to many points in the town where its factory is located, thus giving that community as efficient a fire alarm service as any modern city.

On the whole, the California and Hawaiian Sugar Refining Company is a customer of whom we may well be proud. It represents a capital investment of over \$7,000,000, and its monthly pay-roll is in excess of \$60,000. Its president is Mr. R. P. Rithet, who has been prominently identified with San Francisco commercial life for many years. The vice-president, Mr. Wallace M. Alexander, of Alexander & Baldwin, Ltd., San Francisco, is also prominent. The remaining officers and directors are also all California men.

The Office Boy Says:

Gee, no country vacation for mine—say, my boss came back the other day, and holy smoke! sure he had no skin on his face, and he looked like a bad morning after the night before. No, it don't go with me, honest to goodness; misquilloes with bills like our collectors have full of killy wals, and cubists feel—grub that would make Coffee Dan's look like the St. Francis—stlaty beds with holes in 'em, and, say, bugs like a gnat's heel up to a elephant—and you hike along a dusty road, and swear you're having the time of your life, when you long for Market street, or Powell.

Let me give you the dope on a vacation—just dear old San Francisco—'n just how to smother a week in fun. Listen, here my eye-lin-rary.

Monday—I goes down to the wharves, scenery everywhere, big boats tied up to piles, and, believe me, every son of a gun on dose boats is a workin' and you give them the once over on the ha! ha! cause youse loafin'—you see the Jap, and the Chink, the Greek and all them funny fellers, and they're paintin' and scrubbin' and loadin' and unloadin' and then youse can sit on a stringer and catch pogies and smelt and rock cod, and then the water looks fine—any time.

Tuesday—I gets up early and goes to the Panama-Pacific Exposition. My, but that's some place, real picture book stuff, and the flowers and buildings and grass, and where Chimmie O'Neal and me went swimmin' now is grass and trees, and you sits on de S-play-nade and looks at old Alkatraz, and Angel island, and over to Tamalpais, and, say fellers, "the water is some blue."

Wednesday—I meant to tell you, I got Mudder to wrap me up each morning two slices bread, with sugar and molasses on 'em, and three doughnuts, and some cake, for lunch today was sardines—great! So this morning I hikes thru the Park and I watch the rich fellers in Auties—nothin' doin' for that lazy sport, shanks' mure for me, and I sit in the shade, when I like, and I goes to the Musum—my, what a lot of things that nobody has no use for, and I visit Strawberry hill, and a kid I know gives me a ride in de boats, and, say, a long swan, a black feller, grabbed a doughnut from me. Then to the beach and I fell asleep on the hot sand and the waves tickled my feet and woke me—sure I was dreamin' I was goin' to China—a big guy gave me a nickel for holdin' his horse and then I rode home.

Thursday—I started over to Mission Dolores and then up to twin peaks. Say fellers, dere's a cave in the hill near the reservoir, it's great—then by Corbett's road down to Ingleside. And, say, I watched a lot of old geeks hit a ball with a stick and chase it; only, say, it's funny; they walk after it, like they was too tired, never hurry, and maybe, I don't know exactly, but they look too weak to carry sticks, and a poor kid follers 'em along with fifteen or twenty sticks, and I was told by Mike that he is called a "Tea Caddy"—it must be "Oolong" or "Come a long." I looked into a big white building on the booyard, with Bible lessons all over it, written, so Billy told me, by Willus Polk—and you just see wheels agoin' round, not Willuses but machinery—it's great! Then hike over Forest Hill and home, and right away for the feathers.

Friday—Mudder didn't wake me early, cause it wasn't Mayday—so I staid home and took the weeds out of de garden, and in the afternoon I went to the ball game. Say, it was punk all right, all right; why de kids on de 4th floor could wallop the tan out of the champions if Joe Butler would pitch for 'em. Mudder gave me ten cents when I got home, and, say, I was a regular sport. I went down town, and took in two movies—good night.

Saturday—I got the tourist fever sure, and so I got Dad to advance me two bits, and crossed the bay to Berkeley, talk to me no more of swiss alps, they're not in it, and the view—well, some day, when Lizzie and me gets spliced a home on the hills over there and the University—I wished I could write beautiful like our editor. It's sure great and then some, my! I guess maybe I'll be a professor so's I could live there, but then I think maybe I like old San Francisco, so I guess I'll be a general manager.

Sunday—Dad says to me at breakfast, "say, kid, I guess you got the 'wander lust,' and I says is it like poison oak or measles, and he says worse, and I says where did I get it, and he says, God knows, and Mudder she says, "Jahu lake another pancake," and he did, and I don't know if I will break out with the "wander lust," but if I do all right—I had a good time while it was coming, then Dad says I know a church to go to, and I says, how did you, and Dad says he read it in the papers, and Mudder says then its O. K., cause Mudder alters believes what she sees in the papers and that's why women vote. So I says to Dad church goes. How's that for a vacation, and my nose isn't peeled—can you beat it?

The Development of a Simple Automatic Pumping Plant for Domestic Service

By C. E. SEDGWICK, Manager Solano District

IN the country districts, and in small towns having no public water system, there is quite a field for small electric pumping equipments to furnish the domestic water supply. In many cases tank-houses have been built and a small motor and centrifugal pump installed. There is considerable objection to the tank-house on account of first cost, and, in towns especially, there is further objection due to its unsightly appearance and the limited space in which to locate it. Also, the small centrifugal pump has been found very inefficient when operating under these conditions. In fact, a test made by the writer on a 1 horsepower motor belted to a 1-inch centrif-



C. E. Sedgwick

ugal pump, which sucked the water 16½ feet and discharged it at an elevation of 27½ feet, total lift 44 feet, showed the plant efficiency to be but 9½ per cent; that is, but 9½ per cent of the energy put into the motor was in the water after

delivery at discharge, the rest having been dissipated in the motor, pump and piping. That a large percentage of this energy was wasted in the pump will be shown later by comparison with another test.

The pneumatic pressure system has come into vogue in recent years, and as this can be located in the basement of the house, or in a small outbuilding, there is no objection to it as far as unsightliness is concerned, but, as furnished by the

regular manufacturer, the equipment is so expensive that it has no particular advantage over the tank-house in this respect. Furthermore, the pump and motor equipment is of such small capacity in the average residence (1-6 horsepower in one case that the writer knows of) that in sprinkling lawns the pump will not furnish enough water to operate one sprinkler satisfactorily after the water in storage is exhausted. These small plants are usually furnished with storage tanks of from 70 to 200 gallons' capacity, so that it does not take long to empty them. Larger tanks, of course, can be installed, but at considerable additional expense of both money and space.

To overcome these objections the Solano District installed an experimental plant on the premises of one of its consumers in November, 1911. The equipment consisted of a ½-horsepower single-phase



½ H. P. single phase motor and 3"x5" double acting piston pump.

motor belted to a 3-inch by 5-inch double-acting piston pump, an ordinary 30-gallon drum such as is used to furnish hot water supply in residences, and an automatic pressure switch. The entire outfit cost somewhat less than half the price of an ordinary tank-house system.

Considerable trouble was at first experienced with the automatic pressure switch, but the manufacturer eliminated certain weak points, and for the last two years the above plant has been operating very satisfactorily and its success has resulted in the installation of several other similar plants.

A test was made on one of these plants where the water was sucked 17 feet and discharged at a pressure of $15\frac{1}{2}$ pounds (equal to an elevation of 37 feet) or a total lift of 54 feet. The plant efficiency was found to be $26\frac{1}{2}$ per cent. This indicates that the cost of pumping with this plant is about one-third that of the centrifugal pumping plant mentioned above, for the latter would show an efficiency of still less than $9\frac{1}{2}$ per cent had it been working under the higher total lift to which the plunger outfit was subjected.

The plunger plant has a capacity of 13 gallons per minute, and as an ordinary lawn sprinkler delivers about 5 gallons per minute, the $\frac{1}{2}$ -horsepower equipment will easily supply two sprinklers continuously. This is ample capacity for the average residence; in fact, there are plants of this size operating on ranches in this district where there is a good-sized lawn about the house, and from 15 to 25 head of stock to water, and the equipment has no difficulty in meeting the demand. This indicates that there is no need of installing a 2 or 3 horsepower plant, such as is usually called for by the prospective consumer.

For the benefit of those who are not familiar with the automatic air pressure system, a brief explanation of its principle of operation may be in order. The pump, instead of discharging into a tank,

is connected to a pressure receiver, this being, in the case mentioned above, a 30-gallon drum. The piping system to be supplied is also connected to this drum. If all cocks on the piping system are closed, the water will rise in the drum when the pump is started, compressing the air above it with a resultant increase of pressure on the drum. To limit this pressure an automatic pressure switch is also connected to the drum, and this opens the motor circuit, stopping the pump, when the pressure rises to the desired point, say 30 pounds. This condition continues until a cock on the piping system is opened, when the compressed air in the drum forces the water out with a resultant reduction in pressure to a point where the automatic pressure switch closes the motor circuit and starts the pump. On shutting the cock, or if the pump is putting more water into the drum than is passing through the cock, the pressure will rise until the automatic pressure switch again stops the pump.

The pressure switch is simplicity itself and consists of a chamber, on one side of which is a metal diaphragm, which is pushed out as pressure increases. This movement, by means of a lever connected to the diaphragm, finally opens the motor circuit, and on the pressure being reduced by drawing water the reverse operation takes place.

It is seen that the water pressure is automatically maintained, and one has but to open or close a cock, as in the case of the instantaneous gas water heaters now coming into such general use, and the machinery does the rest.

This small outfit when installed, as shown in the accompanying illustration, occupies but a 2-feet by 6-feet floor space and needs but 5-feet head room. On account of its simplicity, satisfactory operation and low cost as compared with other means of producing the same results, it should commend itself to those wishing to have their own domestic water supply.

Some Telling Points Against the Proposed Universal Eight-Hour Law

PRACTICALLY every fruit-grower in California is against the proposed amendment to the Penal Code of the State fixing a legal day's work at eight hours and providing penalties for any employer who either requires or permits any employee to exceed this limit.

Everywhere the producer has arisen in his might, has girded up his loins and gone forth to fight this most disastrous measure. The farmers of the coast counties, especially, realize what the enactment of such a law would mean to them, and the Farmers' Protective League is circulating effective literature warning the voters of California to look out for this among the multitude of propositions offered for their consideration at the polls in November.

The following categorical objections to this measure are set forth in printed circulars issued from the League's headquarters in Sacramento:

1. The proposed Universal Eight-hour Law would increase the cost of production of all foodstuffs because the farmer—the producer—would be compelled to employ more persons, many of whom could work only part of a day, thereby causing a new and greater economic waste. In harvesting seasonal crops farmers would be forced to face additional hazard by reason of inability to obtain sufficient competent help, which is the case under present conditions. As an example: If fruit is not picked at the right

time it is useless for all purposes, and fruit-grower suffers a loss that is felt by the whole people in curtailment of product and consequent increase in cost.

2. The proposed Universal Eight-hour Law, operative in California alone, would put all California products in unequal competition with products not only of

Here Is the Eight-Hour Law

"An Act to amend the Penal Code by adding a new section thereto, to be numbered 393½, limiting the hours of labor of employees and providing a penalty for violations of the provisions of this Act.

"The People of the State of California do enact as follows:

"Any employer who shall require or permit, or who shall suffer or permit any overseer, superintendent, foreman, or other agent of such employer, to require or permit any person in his employ to work more than eight hours in one day or more than forty-eight hours in one week, except in cases of extraordinary emergency caused by fire, flood or danger to life or property, shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not less than \$50 nor more than \$500 or imprisoned in the county jail not less than 10 nor more than 90 days, or both so fined and imprisoned."

neighboring states, but of the whole world, and while diminishing the product and increasing the cost thereof, the law would afford no relief for the California farmer, who does not and cannot regulate the prices of products here or elsewhere.

3. The proposed Universal Eight-hour Law would force white men and women into unequal and undesirable competition with alien peoples by compelling the employment on farms of additional help, which experience has shown is not avail-

able except when recruited from the ranks of Hindoos, Japanese and Chinese, which races are unassimilable and therefore should not be considered and fostered as permanent factors in the development of agriculture and other industries, and in the social life of California.

4. The proposed Universal Eight-hour

Law is not equitable in that it would punish the employer who permits an employee to work more than eight hours a day, but would not punish an employee who would work longer than the maximum hours fixed. This would make it possible for a dishonest employee to injure his employer by actually continuing work for more than eight hours and harass and embarrass his employer by causing the arrest of said employer. Also, the measure does not prevent or punish persons working under the co-operative or co-partnership plan from engaging in as many hours' work as desired. This would discriminate against whites and favor aliens, who do operate farms on the co-operative plan.

5. While regulating hours of farm labor the proposed law does not and cannot regulate the working of nature in bringing into bearing the fields, the trees and the vines. The sun shines more than eight hours, the rains fall without regard to the element of time. It is impossible for the farmer to lock up his trees, as one would an office or a factory, or to order the grain to cease heading out when a whistle is blown. The cow has not been developed on an eight-hour basis; horses and cattle, sheep and pigs and chickens are unaware of man-made mandates, and they require care and attention throughout a longer period than permitted under a Universal Eight-hour Law.

6. By decreasing the production of farms save at unusual and unnecessary expense the proposed Universal Eight-hour Law would very materially affect the earning power of the land, and by doing so correspondingly reduce land values, which in turn would cause a very pronounced reduction in credits. When land values are lowered by compulsory and arbitrary methods, the financial system is disarranged and disrupted, and

serious stringency, if not absolute loss, is suffered. This condition would be apparent with all banks loaning money on California farms and real estate, and since the money so loaned belongs to the depositors, the people as a whole, and not the banker, would lose.

7. The proposed Universal Eight-hour Law would strike at every industry and individual, not only the farmer, but every person who is employed in any capacity. The housewife likewise would feel its burden, and a rearrangement of domestic life would follow inevitably. The household servant who prepared breakfast could not serve the supper if the interval between these meals was more than eight hours.

8. The workingman would be prevented absolutely from working overtime, no matter how desirous he may be to do so and regardless of the fact that he may be well paid for his services. This would curtail his income and consequently limit his expenditures. By decreasing the earning power of the worker his spending power is lessened; and while the cost of production has been increased, the purchasing power of the dollar has been decreased. A very natural and positive depression must follow.

9. There would be no advantage accruing to women workers by the adoption of the proposed Universal Eight-hour Law, since the working hours for women, except domestics and those working on perishable fruits, etc., are already established by law as eight hours.

10. The proposed Universal Eight-hour Law, if adopted, would not be subject to veto by the Governor or amendment by the Legislature, since it is an initiative measure, but could only be changed or altered by direct vote of the people after a new measure had been initiated by petition.

The Farmers' Protective League is said to have branches in fifty counties of California. It represents but one of the many organizations that are up in arms against the proposed eight-hour law. Voters are warned against the danger of overlooking this in the mass of measures that have been placed upon the State ballot in November.

Another equally objectionable measure is the proposed Prohibition Law. This will be dealt with in a future issue.

“Pacific Service” Extends Its Profit-Sharing Offer to Its Consumers

OUR Company took a long stride forward upon the path of Home Industry recently when it extended to its consumers the offer previously made to its stockholders and employees to become purchasers of the new \$12,500,000 preferred stock issue upon the installment plan already outlined. The offer to consumers was contained in a circular sent out July 24th and bearing the signature of Vice-President and General Manager John A. Britton. The circular contained the following announcement:

A number of our consumers have requested the privilege of joining in this subscription, thus obtaining an opportunity of sharing in the profits of the Company and possessing a voice in its management. Believing it to be to the advantage of the Company as well as its consumers that the stock should be distributed to as large an extent as possible among the representative citizens of California who are our consumers, the directors of the Company hereby extend an invitation to all consumers to purchase a portion of the above First Preferred Stock directly from the Company, at the minimum price authorized by the Railroad Commission.

The attention of consumers was directed to the principal features of this first preferred stock issue, among which are: (a) That it is tax free in California and the income derived from it is not subject to the normal Federal Income Tax; (b) that it is non-assessable; (c) that it carries a dividend of \$6.00 per share per annum and that all dividends are preferred and cumulative, that is, they must be fully paid for the entire period upon which the stock has been issued before any dividends can be paid on any other stock of the Company. The following additional features of a sound and desirable investment were given:

(a) Its security rests upon a property of large value, serving with gas, electricity and water, constituting everyday necessities, the population of a territory which is large, constantly growing and with which our consumers are personally familiar. Every share of the new stock has back of it more than \$100 of property value. This stock also has preference over other stock issues of the Company, which have a present day market value in excess of \$20,000,000.

(b) The property has a large, well proven and increasing earning capacity. It is a well recognized fact that business depressions have little influence on the earnings of public utilities of this character. In every one of the eight years since the organization of the Company its earnings have been largely in excess of the amount of the annual dividends on this stock and, as shown in the following table, the margin of safety during the past five years has been so large as to leave no doubt of the ability of the Company to pay the dividends on this new stock regularly.

(c) The stock will have a recognized market value, thus making it available for ready cash sale or as security for loans.

The additional announcement was made that arrangements had been entered into with leading banks all over the Company's system to handle subscriptions and payments. The list published included the Bank of California, Crocker National Bank, Donohoe-Kelly Banking Company, Mercantile National Bank, Savings Union Bank and Trust Company, and Wells Fargo Nevada National Bank, all of San Francisco, and the leading banking institutions in the following cities of the Company's territory:

Alameda, Antioch, Berkeley, Burlingame, Centerville, Chico, Colfax, Colusa, Concord, Crockett, Davis, Dixon, East Auburn, Elmhurst, Fresno, Grass Valley, Hayward, Lincoln, Livermore, Los Gatos, Martinez, Marysville, Mayfield, Mill Valley, Mountain View, Napa, Nevada City, Newman, Niles, Oakland, Palo Alto, Petaluma, Pittsburg, Pleasanton, Redwood City, Richmond, Rio Vista, Roseville, San Rafael, Sausalito, San Anselmo, Santa Rosa, Sebastopol, Sacramento, San Mateo, San Jose, San Leandro, South San Francisco, Stockton, Suisun, Sunnyvale, Vallejo, Walnut Creek, Wheatland, Winters and Woodland.

This plan to put employees and consumers on a plane of equality with stockholders in a profit-sharing undertaking is only three weeks old, yet already it has shown results in the practical doubling of the number of the Company's stockholders. Furthermore, a feature most satisfactory to the management is that the new stockholders are practically all California people whose interest as owners in the property will be a source of strength to the Company in many ways. In a word, the Pacific Gas and Electric Company's enlightened appreciation of the value of strong local opinion in its favor has resulted in the giving to the Company's customers an opportunity for making a safe as well as remunerative investment upon terms which heretofore have been enjoyed by only a limited number. That this opportunity is being availed of will be seen from the books of the Company, which show that since the offer was made public employees and consumers between them have subscribed for upwards of \$1,250,000 worth of this stock. And this, it must be remembered, at a time when everybody is not looking for investments.

The number of consumers of "Pacific Service" today is placed at 358,288. The following comprehensive table will show the gain in consumers made by our Company during the past seven years:

June 30	Gas	Electric	Water	Steam	Total
1907	169,929	47,349	5,263	.....	162,541
1908	125,092	56,748	3,432	.....	187,272
1909	131,236	64,593	5,770	.....	201,599
1910	142,666	73,883	6,184	.....	222,733
1911	156,381	91,379	6,914	17	254,691
1912	183,667	106,197	7,769	160	297,793
1913	199,661	121,099	7,990	233	328,983
1914	211,132	137,916	8,873	307	358,288
Gain in 7 Years . . .	101,203	90,567	3,610	307	195,687

Meanwhile our earnings, owing to the millions of dollars of new money invested in our latest hydro-electric development on the South Yuba and Bear rivers and, also, in the general enlargement of the Company's facilities in every portion of the territory served by it, are growing to a point more nearly commensurate with the tremendous value of the property employed by the Company in its operations. This material increase in earnings, of course, plays its part in insuring the absolute safety of our Company's securities, particularly of the new first preferred stock offered to the Company's consumers which, as already stated, has been placed ahead of approximately \$42,000,000 of other outstanding stocks of the Company. Here are the latest figures presented by Treasurer A. F. Hockenbeamer:

MONTH OF JULY, 1914

		Increase over July, 1913
Gross Revenue, Elec. Dept	\$ 690,182	\$ 61,161
Gross Revenue, Gas Dept	524,912	66,425
Gross Revenue other Depts	135,228	12,844
Total Gross Revenue	\$1,350,322	\$ 140,430
Net Revenue	613,181	212,734
Net Revenue after Bond Int. and Discount	276,611	205,114

SEVEN MONTHS TO JULY 31, 1914

		Increase over same Period last Year
Gross Revenue, Elec. Dept	\$4,977,778	\$ 311,156
Gross Revenue, Gas Dept	4,114,834	322,374
Gross Revenue other Depts	845,708	47,913
Total Gross Revenue	\$9,938,313	\$ 681,443
Net Revenue	4,801,222	943,970
Net Revenue after Bond Int. and Discount	2,444,382	877,068

TWELVE MONTHS TO JULY 31, 1914

		Increase over 12 Months ended July 31, 1913
Gross Revenue, all sources	\$16,888,780	\$1,371,104
Net Revenue	7,815,101	1,440,794
Net Revenue after Bond Int. and Discount	3,817,510	1,283,656

Tidings From Territorial Districts



San Francisco District

Beside the many activities in the San Francisco District at this time incident to the lighting of the Panama-Pacific Exposition may be mentioned those necessary to supply the extensions of the municipal railway with power, as well as to take care of the rapid growth in the commercial load.

As is well known, the city at this time is engaged in building lines over Van Ness avenue to the Fair grounds; across Market street over Eleventh to Potrero avenue in the Mission, and over Stockton street from Market. While this new demand upon "Pacific Service" has called for a greater substation capacity it has in no way required a change in substation location, and the only new location called for is one for the new Station "K," which will be out on Twenty-fourth avenue in the Richmond District. This new station is necessary, not only to take care of the heavy traffic on outer Geary street, but, also, to take care of a fast growing lighting and power business, thus relieving Station "G" at Ellis and Broderick streets, which although the newest substation in this district is already run at full capacity.

Down at Station "J," on Sacramento street, work is well under way for a large addition. This station has been running at full capacity for some time, and a growing load demands more apparatus. A railway set in this station will handle the Stockton street line, and the down-town traffic on Union street.

The new work at Station "F" at North Beach is well under way, and the Construction Department will soon have it in full operation. It is from here that the Exposition will be supplied, and railway sets installed that will handle the lines on lower Van Ness avenue and outer Union street.

Station "I," at Eighth and Minna streets, has already been worked to the limit, and with the extension of the municipal lines and the establishment of the new civic center is found inadequate for future needs. A large addition is being made to the building, and a railway machine will help handle the Van Ness avenue lines and the Eleventh-street extension. This building is now well under way. After the new line leaves Eleventh street it passes to Potrero avenue and out that thoroughfare.

This brings it into the district supplied from Station "E" at Vermont and Mariposa streets, consequently this station must be enlarged, which will be done by an addition to the building and the installation of more apparatus.

Out at the Potrero gas works they are installing two new gas-generators, with the necessary accessories. This calls for a large addition to the station's electrical equipment to operate blowers, pumps, etc. Two new cables will be run from Station "A" to a center of distribution at the works. From this point services will be run to the different places. The switchboard has already been installed at Station "A."

Work has been started for the new switch-house at Station "A," and the Construction Department expects to have it completed within a few months.

A set of very interesting machines has just recently been installed by the Western Sugar Refinery in the Potrero. As is well known, the worst of a grocer's troubles lies in the handling of sugar, getting it at wholesale in large lots and putting it out to customers in small packages. The sugar refinery will now supply sugar to grocers in packages of different sizes, thus doing away with the weighing and packing, quite an item of saving to the grocer. The machines above mentioned will do this work. They are all electrically operated, weigh the sugar into the bags and then sew them.

T. E. FOGALSANG.

On Saturday evening, July 11th, the attendance at the "Pacific Service" Club was extremely gratifying. It was necessary to remove some of the chairs so as to permit all of those attending to gain access to the hall.

The occasion was the lecture on "Electrical Measurements" by Mr. Schnapp of the General Electric Company. Mr. Schnapp fully described and illustrated the fundamental principles and workings of the volt-meter, ammeter and megger. The course of the lecture was closely followed, and the members showed their appreciation of Mr. Schnapp's kindness in giving this lecture by a rising vote of thanks and a hearty ovation.

Mr. Holberton was scheduled to speak on the stock offered to employees but was called out of the city. Mr. Lisberger filled the engagement and gave an exhaustive talk on stocks, both common

and preferred. It is safe to say that after Mr. Lisberger finished, every one in the room had a clear idea of the company's purpose in offering this stock to its employees.

Mr. P. E. Wahlman, an eminent German engineer, who has recently completed a hydro-electric development in the Argentine Republic, visited the Engineering Department lately.

Mr. Wahlman is on his way around the globe inspecting works of an engineering character. He visited our steam-station "A," in San Francisco, and expressed himself as very much interested in everything he saw. On leaving he took with him a number of photographs of our Spaulding-Drum installation, which he will take home to Germany with him as samples of the work being done on the Pacific Coast of the United States.

The following is a copy of a clipping from "The Mission Enterprise," under date of Saturday, July 25, 1914:

COMBINE GENEROSITY WITH PATRIOTISM.

The Fourth of July Committee who had charge of the celebration in Mission Park desire to express their unqualified hearty and unanimous thanks of its members to the Pacific Gas and Electric Company for its generosity as demonstrated by its connecting wires and installing and furnishing lights without charge for the celebration. This act of benevolent patriotism on the part of the Gas and Electric Company has been the subject of universal commendation throughout the Mission.



Alameda County District

If an Amp. hit a Volt would it KW?

Two and one-half miles of 1 k. v. line extending northerly from the Boulevard at Jones avenue, Elmhurst, will shortly be completed. This line will supply 80 h. p. in motors for the Union Water Company and light and power for the Sequoyah Country Club.

Power will first be used to cultivate land for the laying out of golf grounds, etc., as well as for light in large tents where construction gangs now live. The locating of this exclusive club in the foothills back of Elmhurst will open to the view of our bay people a country rich in sunshine and flowers far from the busy city. Besides the country club itself, there will be numerous other consumers later, a new real estate tract now being laid out adjacent to the club for convenience of its members and those loving outdoor life, etc.

In order to increase the input from the 60 k. v. system to the 11 k. v. network in Oakland, the bank of four 1500 k. v. a. Allis-Chalmers transformers at Station "H" known as bank No. 3 is being taken out and substituted by four 2000 k. v. a. transformers of the same type and voltage. The complement of transformers in this station will then consist of four 2000 k. v. a., three 1500 k. v. a. and four 1000 k. v. a. transformers.

Work in connection with the installation of a complete ventilating system at Station "F," Berkeley, is under way. Three motor-driven exhaust blowers are being installed at the outlets in the roof as a means of forcing the air out of the building.

Owing to increase in load at the California Brick Company's plant, three 340 k. w., 31,215 to 2400 volts, S. K. C. transformers are being installed at the Decoto substation in place of three 250 k. w. transformers of the same type and voltage.

The working quarters of the standardizing laboratory, meter, arc lamp and mechanical repair shops, which have occupied for years a section of the upper floor of the warehouse building at Second street, between Broadway and Washington streets, in Oakland, in charge of Mr. O. A. Knopp, have recently been enlarged through the addition of some 1000 square feet of floor space, bringing the total floor space up to 2500 square feet. A stairway leading up from Second street has been cut in, so as to direct all parties entering the department to the office, which is situated in the central portion of the building. East of the office are situated the shipping room, meter shop, arc lamp and general repair shops. West of the office the general laboratory and instrument shop, and in separate rooms the standardizing laboratory and a battery compartment.

Recently a valuable addition to the laboratory was acquired in the form of three 30 k. w. 22,000 volt transformers for high potential tests. The department is now well equipped to handle most any meter, instrument, standardizing and research work. Redesigning, developing and repairing of most any electrical or mechanical apparatus can be carried out promptly and economically.

For the information of parties who have not known of such facilities and wish to make use of them it may be stated that the proper procedure to have any work on any apparatus attended to is to ship same to Oakland District Warehouse, attention Mr. O. A. Knopp. Shipping notice in duplicate with an order number properly marked thereon, and

stating exactly what is wanted, should be sent to the Electric Testing Department, 475 Second street, Oakland, California.

A very successful fishing trip was enjoyed by J. W. Burge during his vacation which was spent in Siskiyou County, along the banks of Butte Creek which heads on the northeast slope of Mt. Shasta. This is an ideal place for the sportsman to combine hunting and fishing. During his stay at the little place called Bray, Mr. Burge met Mr. J. W. Harris, deputy fish and game commissioner from Greenview, Cal. Mr. Harris assured him that any of his friends would be given a good time if sent his way. For particulars see J. W. Burge, Superintendent of Line Construction, Electric Distribution Department.

Sacramento District

Manager C. W. McKillip has been appointed a member of the Good Roads Committee for Sacramento County. This committee has just been formed and as yet has not had a meeting.

Mr. C. W. Griffith, Superintendent of Gas Mains and Services, and Mrs. Griffith entertained the employees of the Sacramento District and other friends at their home on H street on Saturday evening, July 11th. The completion of the new garage which Mr. Griffith has just erected on his property was the occasion for the dancing party which was held in the garage and was enjoyed by about thirty couples.

Superintendent N. J. Hullin of the Sacramento city street railroad system has an interesting account of the double-track construction work on Tenth street, between Q and Y, which was a good job well and speedily executed. Look out for this, with the accompanying views showing the construction work at various stages, in an early issue of PACIFIC SERVICE MAGAZINE.—Ed.

Redwood District

Redwood District is now working on G. M. estimates to the amount of \$29,000 for reconstruction and the construction of new lines in the north end of the district, which includes Daly City, Colma and the cemeteries as far down as South San Francisco. This work is well under way and is being done under the latest standard specifications.

There has also been approved a G. M. for a 500,000 cubic feet gas storage-

holder at Redwood City. Work on this will commence immediately and every effort will be made to have it completed before winter. The reason for the installation of this storage-holder is the increased consumption of gas on the peninsula. Redwood being the center of distribution, the holder is to be constructed at this point.

Marin District

Assistant Manager H. G. Ridgway and Gas Superintendent A. J. Rix spent July 4th and 5th at Wawona.

On account of the paving of Fourth street, B street and Petaluma avenue, in San Rafael, the company is renewing all mains under 4-inch and all services under 1-inch.

The first section of the State Highway in Marin County, between Sausalito and Larkspur, is well under way. For the first two years this piece of road will be graveled, giving the fill an opportunity to settle.

Friday, July 17th, the gas mains extension into Fairfax was completed, supplying service to forty-five new consumers.

An electric distribution system has been installed in the town of Bolinas, service having been turned on Saturday, July 18th. This little town is supplied from the line feeding the Marconi Wireless Telegraph Company's plant on Duxbury point. Twenty-eight consumers were connected when the current was turned into the lines and a number of others will be added as soon as the houses are wired. This section of Marin County is the most westerly point supplied by our company's wires. Willow Camp, a village across the lagoon from Bolinas, was supplied on Friday, July 24th.

An extension of approximately two miles of 11 k.v. line was finished July 9th for the supply of the Marin County farm and adjoining ranches. The county has just completed a new building for the accommodation of the unfortunates thrown upon its care. This building is of Mission style, two stories in height, construction being of plastered brick with tiled roof. A 5 h. p. motor will be used for pumping water and a motor-driven oil pump and blower will be used in the boiler room.

Thursday, July 23d, the second hearing in the case of F. O. Sirard vs. The Pacific Gas and Electric Company was held before the Railroad Commission. Austin Rix and Wm. Fleming testified in regard to service conditions and Mr. W. G. Vincent as to valuations. The next hearing will be held on September 8th.

Fresno District

The building permits in Fresno for the first six months of 1913 amounted to \$1,044,540, and the first six months of 1914 amounted to \$617,611. Mr. Scott building inspector, advises that July building permits will bring 1914 practically even with the comparative months of 1913. This should be a fair indication that things are going forward in Fresno in spite of financial stringency.

The White Theater, under construction on I street, opposite the City Library, will be completed in November at a cost of something over \$100,000. The theater will be run as a vaudeville house by either the Orpheum or Pantages. Three floors of this building will be used as the new quarters for the University Club. It will be completely equipped, and it is a record for a city of the size of Fresno to be able to maintain a university club of such pretensions.

The city is now trying out a resurfacing machine, and if it tests out satisfactorily it will be purchased. This will enable ourselves and other utilities, who use the streets, to have repairing done promptly, and will make things decidedly more satisfactory with the people in general.

George Hold, construction foreman, is on his vacation at Santa Cruz, resting up after completing the large main lines which we have been installing in north Fresno.

Jim Beveridge, employed in this district for three years, and who was transferred to Sacramento, is reported ill with typhoid fever. However, reports are to the effect that he is on the high road to recovery, but will be unable to work again for a considerable period.

The first unit of five miles of traction line from Fresno to Clovis is completed and in operation. The company building the line expects to have the line completed to Clovis by the end of the year.

Packing houses are now in full action, and labor is at a premium. It will tax the capacity of the packers to handle the very heavy crops of fruit this year. It means that an immense amount of money will come back to Fresno, and we believe that business will be good here as a result.

The Commercial Club of Fresno will hold a political smoker early in August at which all men running for office will be given the privilege of acting as waiters or porters or performing any other kind of service needed at the smoker. Chester Rowell, candidate for United States senator, will probably be appointed head waiter.

Marysville District

Yuba County's participation in the Panama-Pacific Exposition next year in San Francisco will include many hundred feet of motion pictures which will be shown every day in a free theater to be owned and operated by the Sacramento Valley Exposition Commission, and described by a lecturer competent to tell of this county's resources. The county will also share in the largest nugget display ever gathered. About \$100,000 worth of gold will be shown under one great glass case, and an armed guard will watch it day and night. The exhibit will be installed under the personal direction of J. A. Filcher, director-in-chief of the commission.

The contract for the proposed D street bridge will soon be passed upon, and as designed by C. A. Trow will be one of the handsomest structures of its kind in the state.

City Attorney Waldo Johnson this month received a telegram from the Interstate Commerce Commission to the effect that final decision on the terminal rate matter will be suspended until January 30, 1915. This means that Marysville will enjoy terminal rates for at least a few months longer. By the expiration of this time it is thought the matter will have been finally settled.

A large number of improvements have been made in Yuba City this spring and others are now being contemplated by the Board of Trustees. First, there is the lighting system installed some time ago whereby the streets are well lighted with fifty-three 60-candlepower lights on the several main streets. Another decided improvement is the grading and curbing of Shasta street, which is now being rushed to completion and is an excellent piece of work. Then there is the extension of the approach to the Feather river bridge now being planned, which will greatly facilitate traffic at that point, especially heavy hauling. It is understood that the county will stand half the expense of this improvement.

Another great aid to the traffic is the oiling of the outlying streets of the city, which has just been completed in a very creditable manner. The work cost \$1600 and the total length of road covered was five and one-half miles, some of it being oiled double width. This makes a total of 38,720 square yards covered at a cost of \$0.01 per square yard.

For some time there has been an agitation on foot to have a road from Nicolaus through the county to Yuba City to connect with the road that Sacramento County is building from the City of Sacramento to the Sacramento river at Nicolaus. This would necessitate a draw-

bridge at Nicomaus costing about \$150,000 and a macadam road from that point to Yuba City costing \$120,000. This road when completed would be a direct route to Sacramento through the richest part of Sutter County and, in fact, when coupled with the state highway running north of Yuba City would make a complete connection in Sutter from north to south.

One thousand earloads of peaches will be shipped from Sutter County this year, according to estimates made of the crop by District Freight Agent Jas. O'Gara of the Southern Pacific Company, about 400 cars heavier than the shipments of last year. The local cannery in Yuba City has commenced work with from 200 to 300 employees and expects a long run. Fruit picking is in full swing and the ranchers are rejoicing at the good returns this year. The local plant of the Central California Cannery started work on a fifteen-day run on Tuscan clings, which is the beginning of the largest run ever made by the cannery, according to Manager Louis Gaume. They will can 100,000 cases of peaches and 50,000 cases of tomatoes this summer.

The town of Live Oak is progressing steadily. Twenty-eight new houses have been added in a little over a year.

Wheatland is getting ready for hop picking, and while trouble is not anticipated this year, will be prepared to meet it should it occur.

"Pacific Service" is holding it own as usual; there are no complaints of any importance and future prospects are excellent for increased business, both in power and lighting.

Yolo District

On viewing the personnel of Woodland's Volunteer Fire Department, one is struck with its close relation to "Pacific Service," as the following list of names will show:

August Silberstein, Chief, foreman of the Gas Department of the Pacific Gas and Electric Company.

E. Van Tassell, Foreman, lineman of the Pacific Gas and Electric Company.

A. C. Silberstein, Warden, assistant gas-maker of the Pacific Gas and Electric Company.

P. G. Riness, Warden, pipefitter of the Pacific Gas and Electric Company.

B. Blizzard, President, are trimmer of the Pacific Gas and Electric Company.

Lester Armfield, Superintendent of Flag Pole Raising, foreman of the Electric Department of the Pacific Gas and Electric Company.

These firemen and employees of the Pacific Gas and Electric Company, noting that Woodland's City Hall was desti-

tute of a pole upon which to unfurl old glory to the breezes, first persuaded the ladies of Woodland to make them a flag and then they busied themselves in securing a fitting pole. This pole, now standing in front of the City Hall, at the corner of First and Court streets and towering a hundred feet above the street, was planted on Sunday, June 28, 1914. On July 4, 1914, the flag was raised with imposing ceremonies by the following distinguished ladies and gentlemen:

Mrs. Martha Ross Mixon, direct descendant of Betty Ross, who designed our first "Stars and Stripes," and mother of W. F. Mixon, publisher of the Woodland "Mail"; Doctor Frances Newton, daughter of Woodland's first fire chief; R. H. Beamer, the first secretary of the Woodland Fire Department.

Nevada District

A destructive fire occurred in Nevada City on July 14th, which entirely destroyed the handsome home of the Nevada City Lodge of Elks. This fine building had only been completed a little over a year and, unfortunately, the loss is only partly covered by insurance. But the Elks, undaunted, have already displayed enthusiasm in their determination to rebuild their home even more splendid than before.

Our district manager, Mr. John Werry, happens to be Exalted Ruler of Nevada City Lodge of Elks, and he is so actively heading a movement for a new building that committees appointed by him are already at work.

Foreman Wilcoxon of the Deer Creek power-house is the proud father of a husky baby boy born on July 16th.

Placer District

Relative to the condemnation proceedings held recently in the Superior Court in this city, Pacific Gas and Electric Company vs. Rollins, et al., it is interesting to note the large number of interested parties congregated in Auburn during the progress of the trial. Anyone at all familiar with water rights, mining operations, and the past and present progress of the territory represented by Bear river and its watersheds, containing the old time hydraulic mines, will at once recognize the following persons as being identified with Bear river and its interests in some way or other:

J. M. Fulweiler, local counsel, carried on mining operations on Bear river in 1852, and has since been connected with the subject.

Simon Jordan, miner and operator, with a very interesting career running back as far as 1856; now living in Berkeley.

W. B. Hayford, dates back to the early fifties; now living in Berkeley.

Wm. McGuire, has taken an active part in Bear river projects, dating back as far as 1870. Mr. McGuire for many years owned and operated the Liberty Hill diggings.

W. F. Englebright, dating back to 1880. For fifteen years superintendent and engineer for the old South Yuba Water Company.

W. J. McCleary, now at Colfax; for eleven years ditch-tender on the old Bear river canal; with recollections dating back to 1874.

L. B. Allen, of Emigrant Gap; for over twenty-seven years ditch agent at Bear Valley for the old South Yuba Water Company, beginning some time about 1874.

Bob E. Linder, now of Alta, and with personal water right data, beginning in 1882.

W. E. Meservey, present residence in Nevada City; with water facts dating back to 1882.

C. W. Cross, a San Francisco attorney; began his first water case in Nevada City in 1876.

C. W. Kitts, a San Francisco attorney; born and raised in Nevada City, but more or less identified with Bear river and its watersheds the last thirty-five years.

Jas. D. Stewart, of Auburn, our predecessor in interests in the United Water and Power Company in and about Gold Run, with water and mining history dating back to 1889.

Dr. Rollins, of Colfax, owner of Bear river mining property.

Gus A. Wilkie, ditch agent at the head of the Boardman for several years.

An achievement of "Pacific Service" probably not familiar to many readers of the PACIFIC SERVICE MAGAZINE is shown by the fruit shipments from Newcastle in Placer County.

The largest shipment for any one week was 216 cars of deciduous fruits. This leads previous records of shipment by 22 cars. Shipment to evening of July 27th totaled 1019 cars for season. This shows an increase of 310 cars over last season. Add to the total of 1019 cars, 78,895 express packages and some idea will be obtained as to the amount of fruit made possible by "Pacific Service."



Electra District

Herewith is submitted to "Pacific Service" readers a utilization of electrical energy perhaps unique in the sense that

there is no locality in California where power is required for similar operations.

At the Kennedy mine, situated at Jackson, Amador County, is operated a hundred-stamp mill, the largest in the state, for which power is furnished from Electra. This mill crushes upwards of 450 tons of ore per day, and the disposition of residue after amalgamation and concentration has been provided for by the construction of four large wheels fifty-six feet in diameter. Each of these wheels elevates the pulp and water a distance of thirty-six feet and deposits it in an adjoining valley where a concrete impounding dam is now under construction.

These four wheels are operated by four G. E. 15 h. p. motors, belted to counter-shaft and clutch-gear and thence to a 38-foot driving wheel which turns 3.25 r.p.m. Each wheel contains 176 buckets 16 inches long with a 12-inch pitch, holding approximately two gallons of pulp, in the proportion of one to seven, that is, one pound of pulp to seven pounds of water. The axle or shaft is eleven inches in diameter and with flanges weighs five tons.

The wheels were designed by James Spiers, a construction engineer of San Francisco, and while the type is not used to any great extent in the United States it is in successful operation on the Rand and in Australia. On the Rand, wheels up to eighty feet in diameter are favored.

While the first cost is high in construction work of this character, maintenance is low and efficiency high.



De Sabla District

The stork made two visits to De Sabla Power Division during the month. On July 11th a ten-pound baby boy arrived at the home of Mr. and Mrs. H. W. Grant. Mr. Grant is the division ditch foreman.

Mr. L. M. Edwards, first operator at Centerville power-house, is wearing a happy smile, on account of the arrival of a baby girl at his home on July 16th.

Carl Herman, operator at De Sabla, returned to work on July 19th after a five-weeks' vacation trip through the East. Mr. Herman spent part of the time at his old home in Nebraska. While he had a very enjoyable trip, he states he did not see anything that could compare with California, and he was mighty glad to get back to De Sabla once again.

J. H. Davis, operator at De Sabla, has returned to work, very much improved in health. He recently underwent a serious operation for abdominal trouble, and was laid up in the Sacramento Valley Hospital at Chico for more than a month.

The engagement of Harold H. Knox and Miss Lillian Baptista of Oakland has

been announced. They are to be married some time this winter. Mr. Knox is an operator at De Sabla. He will resign his position with the company on July 31st in order to take up his work in connection with the Panama-Pacific Exposition in 1915. Mr. Knox has obtained the concession for the Samoan exhibit, and will leave San Francisco for Samoa on August 4th to collect a troupe of natives, curios, etc. He will return to San Francisco some time in February and will have charge of the exhibit during the Fair.

A new consumer in this district for "Pacific Service" will be connected up in a few days, Mr. Barnette, who is opening up a mine near De Sabla, having signed up a contract for electricity to supply power for the mine.

On account of ill-health, J. W. Dooley, foreman at De Sabla, has been granted a four-months' leave of absence. Mr. J. R. Carl, of the Marysville Power Division, is filling Mr. Dooley's position at De Sabla.

Mt. Lassen has been very active the first part of the month and a splendid view of the volcano can be obtained from Inskip, ten miles north of Camp No. 1, the division headquarters.

Two G. E. recording and integrating flow-meters have been installed on pipe lines No. 1 and No. 2 at De Sabla powerhouse. The meters will measure and record all of the water used for the generation of electricity at the plant. A Lietz water-register has also been installed at the Centerville plant to measure and record the amount of water used at the plant for the generation of power.

The De Sabla plant and out-buildings are receiving a new coat of paint. The buildings are being painted in standard colors and when completed the appearance of the plant will be improved one hundred per cent.

L. I. Spangler and Chas. Colman of the Centerville plant spent the week-end July 18th and 19th at the head of Butte creek trout fishing. They report catching the limit on both days.

Santa Rosa District

The local gas department has lost the services of Mr. Oscar P. Abrahams, foreman of the main and service work in the district, who has been transferred to San Francisco. His transference is in the nature of promotion, of course, but Santa Rosa hates to lose him. Manager M. G. Hall writes:

"He was one of the most conscientious, willing and loyal employees of the district. In case of trouble he was always ready and willing at any hour of the day or night."

His place has been filled by the pro-

motion of A. S. Cummings, formerly meter-reader and collector. Percy B. Hanson, formerly storekeeper, takes the position vacated by Mr. Cummings, and Frank B. Baird, an old employee of the Auditing Department who has resided in Santa Rosa a couple of years or more, has been appointed to the position vacated by Mr. Hanson.

The district also mourns the loss of Miss Marion T. Abrahams, who on July 18th was united in matrimony to Mr. Franklin W. Young, a San Francisco druggist. The ceremony took place in San Francisco and, owing to the recent death of the bride's brother, Alfred W. Abrahams, was strictly private.

"It is with much regret that employees and patrons of 'Pacific Service' in Santa Rosa part with 'Sunshine,' as she was formerly known by her friends, and one and all join in hearty best wishes for her," writes Manager M. G. Hall.

Solano District

About a year ago the Fair ranch, a reclamation district near Knights Landing, consisting of about ten thousand acres, was purchased and put on the market in small tracts. At that time there was only three or four camps on the property. Today there are forty settlers with families on the tract and about sixty more to locate there in the future. We supply power for operating the reclamation pumps for this district.

Mr. C. S. Frost, division foreman, will leave August 1st for two weeks' vacation, which will be spent in Lake County in fishing and hunting. The trip will be made in Mr. Frost's Mitchell car.

It might be of interest to the magazine readers to know the results obtained in the operation of the Drum-Cordelia line. Since the line was put in operation there has not been a single case of trouble on the forty miles of this line in the division.

Arrangements have practically been completed for cutting a drainage canal from Knights Landing through Reclamation District No. 730 to Yolo Basin. This will drain the Colusa Basin, and will protect over one hundred thousand acres of land from floods. Part of the protected land is in districts which are reclaimed, but which have been subject to the flood stages of the river, due to the fact that the Sacramento river water would flow back into the present outlet at Knights Landing. With a drainage canal cut from Knights Landing to the Yolo Basin, the drainage from the mountains west of Colusa will have an outlet which will be independent of the stage of the water in the river.

We have built about half a mile of line around the upper end of the canal site, so that dredgers which are now on the ground can work on the canal.

Some time ago Mr. Keaton, a restaurant keeper in Winters, became interested in the Berkeley electric cooker and installed two in his place of business. He was so pleased with the results that he obtained the agency for the device and started out on a selling campaign. Up to date he has sold over thirty cookers, notwithstanding the fact that they cost somewhat more than the average person wants to put into a device of this kind. The revenue varies all the way from 75 cents to \$2.00 per month per cooker and the total revenue is considerably more than we get from a good many of our pumping plants.

Mr. J. A. Kerr, the genial proprietor of the Dixon Creamery and Egg Depot, went into the venture of manufacturing and selling ice early this summer. His returns have been very satisfactory and when his friends sing the old song to him he smiles, notwithstanding his somewhat increased power bill. He has also just about completed a steam laundry, which will be up to date in every respect, including "Pacific Service" for power and ironing.



Rotary Clubs to Gather at San Francisco Next Year

The fifth annual convention of the International Association of Rotary Clubs went to the south this year, being held at Houston, Texas, from June 22d to June 26th. Fully one thousand Rotarians from all parts of the United States, Canada and Great Britain were in attendance, enjoying almost a week's sojourn in the Lone Star State. The convention was declared to be the best ever held. The Pacific Coast representation comprised delegates from Victoria and Vancouver, B. C.; Spokane, Seattle and Tacoma, Wash.; Portland, Ore.; San Francisco, Oakland, Stockton, Sacramento, San Jose, Los Angeles and San Diego, Cal., and Phoenix, Arizona, all traveling in a train known as "The Rotary Special." En route, we were entertained at Los Angeles, and El Paso, where a great many availed themselves of the opportunity to cross the border over the Rio

Colusa District

The Colusa District office is now located at 120 Fifth street, just across the street from the old location. This is the first time the office location has been moved since electricity was introduced in Colusa, about thirteen years ago. Some of the old timers will go to the old location and say when they find the right place that we move so often they have a hard time keeping up with us.

The Colusa "Daily Sun" has been publishing the following:

"GASOLINE STOVE FOR SALE.

"A good two-burner gasoline stove for \$1.50; now using gas and have no further use for it. B. L. McCue, corner Second and Lafayette."

This from the "Colusa Herald":

"The Pacific Gas and Electric Company announces that it will try to have its employees become stockholders in the company, and therein the P. G. and E. Company makes the shrewdest business move we have noticed recently. If the company can get every employee to feel that he is working for himself many of its troubles are over. Luck to it in the experiment."

Grande river into the old city of Ciudad Juarez, Mexico, where signs of the revolution were in evidence.

We took a noon trip to Galveston on Wednesday, June 24th, and with the efforts that were made at this time and throughout the entire session by the Pacific Coast delegation, which was a unit for San Francisco, it was practically conceded that the 1915 convention will be held in the Exposition city. On Friday evening, June 26th, a lecture, accompanied with slides, was given by Dr. F. A. Fisher of the Panama-Pacific International Exposition, showing beautiful views of the Panama Canal, the 1915 Exposition and dear old San Francisco, every person in attendance being presented with a California poppy and a copy of our well known song, "I Love You California."

July 13, 1914.

W. S. COLEMAN.

Items From Women of the Company

This section of PACIFIC SERVICE MAGAZINE is open to any of our women employees who may desire to contribute notes on persons and events. The following have accepted appointment as contributing editors: Miss Letitia A. Curtis, Engineering Department, Hydro-Electric Section; Miss Bertha J. Dale, Auditing Department, San Francisco District.—Editor PACIFIC SERVICE MAGAZINE.

One point most essential for the welfare of a corporation lies in the gaining of the confidence and goodwill of the public. To gain this, we, the employees of such a corporation, must at all times be courteous. Courtesy should be the keynote, for we are sure to meet with customers who imagine that they are being unjustly treated, and if we are courteous and treat them as we would care to be treated, we can make them feel that this company is at all times just and endeavoring to be on the square.

We have in attendance at our switchboards operators who are skilled along their lines, yet they cannot become thoroughly familiar with the workings of our company and with each and every department. The customer begins to tell his troubles to the operator and, forgetting that he must be transferred to someone else, becomes irritated. How often we go into an office and hear a 'phone ringing here, one ringing there, with no one to answer and a "peevish" customer on the wire. We cannot wonder that oftentimes the customer becomes really angry.

Now, to avoid all this delay, which naturally must occur, an Information Bureau has been founded by several of the electrical companies in the East. Such a bureau has been installed by the Commonwealth Edison Company of Chicago; also by the New York Edison Company, and in each case has proved a wonderful asset. A monitor board, placed within reach of the bureau, enables the person in charge to take care of each and every 'phone as it rings, and in most every case it is a pleased instead of a displeased customer who rings off.

The persons in charge familiarize themselves with the different departments and know just where and how to gain the necessary information desired. This does away with the familiar expressions, "*Hold the wire*" and "*I will transfer you to someone else.*" Our customers should not be subjected to these inconveniences and an information bureau would, I am sure, be one good means of showing our customers that the Pacific Gas and Electric Company is at all times "*At their service.*"

OLIVE B. SHUNN.
Collection Department.

July 16, 1914.

Miss Florence Kertell, receiver in the Collection Department, San Francisco District, left the service of the company July 15th and was given a farewell luncheon in the lunch room at 445 Sutter street. As a small remembrance to Miss Kertell the young ladies each presented her with a handkerchief, which surprised and pleased her very much. Those who participated in the luncheon were: The Misses Elizabeth Gleeson, Mazie Hurley, Florence MacDonald, Phoebe Willecox, Sarah Ober, Nann Fitzpatrick, Margaret Murphy, Bertie Dale, Betty Casey, and Mrs. M. Lacombe.

Miss Kertell was with the company a number of years and "Pacific Service" loses another efficient worker. We wish her much happiness in her new life.

Miss Bessie Dall, a bookkeeper in the employ of "Pacific Service" at Pleasanton, had a narrow escape from being electrocuted on July 18th when she pulled the strands of a broken high-voltage wire out of the way of passers-by.

One of the lines on Main street, carrying 2300 volts, had burned in two and the ends had fallen to the street. There being no one present at the time to repair the damage, Miss Dall telephoned the Livermore office and was told to watch the wires and see that no one touched them. So that the wires would be out of the way, and without knowing the risk she ran, Miss Dall pulled the broken ends to one side of the street. Had the wires not been well insulated her life would have been sacrificed in her effort to remove the danger from others.

On Thursday, July 9th, Mrs. L. White of the Collection Department was the recipient of a pleasant surprise, the occasion being her birthday. The young ladies in the bill-checking office of the Collection Department had planned a luncheon at one of the downtown restaurants, but on second consideration the earnest workers of "301" decided in favor of an electric iron as a more suitable remembrance.

Those who contributed were the Misses Alice Tauphaus, Olive Shunn, May Callaghan, Zoe Sweet and Edythe Vera Leavy. Mrs. White was happily surprised.

And now Dan Cupid has been busy in our Drafting Department, San Francisco. We are informed of the engagement of Miss Ruth Blewett and Mr. Frederick W. Brown, both of that department. No date has yet been set for the wedding.

Miss Florence Kertell, receiver in the Collection Department, San Francisco District, became the bride of Mr. J. Clark Benson of the Assistant Secretary's office of the San Francisco District, at a pretty home wedding in San Mateo on Wednesday evening, July 22, 1911. Mr. and Mrs. Benson spent their honeymoon in the Sierra Nevada mountains and have returned to San Francisco to make their home.

We wish the young couple happiness.

On June 24th, Miss Claire Hullin, daughter of N. J. Hullin, Superintendent of the Railway Department, was married to Mr. S. M. Johnson, an employee of the Associated Oil Company. After a honeymoon in the southern part of the state, Mr. and Mrs. Johnson will be at home to their friends at Fellows, Cal.

That little villain Cupid is on the war-path in the Alameda County District. He is continually on the job seeking new material to swell the ranks of the newly weds.

It appears that his latest successful campaign was centered about the Marin shores and in the shadows of Mt. Tamalpais where his victims have been known to have passed many happy hours. They say that they go fishing, but we never see the fish.

Miss Margaret Elizabeth Mulgrew, daughter of J. J. Mulgrew, Superintendent Gas Meter Department, Oakland, and Mr. Harry Truslon Roberts, foreman of garage, Oakland, were wedded on Monday, July 27, 1914. After a trip to Sacramento by boat and a two-weeks' stay in the mountains, they will return to their new bungalow in East Oakland.

In Memoriam

Hazel Nash Pitts, only daughter of Mr. H. P. Pitts, Industrial Engineer, Pacific Gas and Electric Company, passed away in Oakland on July 27, 1914, after a lingering illness extending over two years.

She was a young and beautiful girl just entering into womanhood and beloved by all who knew her. Her patience and sweetness of character through all her long suffering were characteristic of her life.

Pacific Service Magazine

PUBLISHED IN THE INTERESTS OF ALL EMPLOYEES OF
THE PACIFIC GAS AND ELECTRIC COMPANY

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The Pacific Gas and Electric Company desires to serve its patrons in the best possible manner. Any consumer not satisfied with his service will confer a favor upon the management by taking the matter up with the district office.

VOL. VI. AUGUST, 1914. No. 3

EDITORIAL

All Europe is ablaze, and now, surely, is the day of opportunity for our own United States.

Abundantly resourceful within herself, self-reliant and progressive, this country should now march onward without halt to her goal of financial and commercial supremacy among nations.

True, there is something of a scare abroad in the land just now, and the pessimists are predicting all sorts of hard times as a result of the death-struggle in which the entire European continent is engaged. Just why America, which for the present is out of the mess and looks like being able to keep out, should go to pieces because her sister countries across the seas are due to cripple one another, beats all human comprehension. If this be not the dawning of an era of unexampled prosperity, of unsurpassed distinction, for this land we live in and love, then there is something wrong with the signs of the sky—some trickery about the handwriting on the wall, so to speak.

We know from statistics that the aggregate of exports annually from America is about double her imports. It is complained that the European war has killed export trade and that this country will be left with a load of unsalable products on her hands. This, to a great extent, may have been true at the very

outbreak of hostilities, but to suppose that any such conditions would be lasting was the veriest nonsense. Already the word has gone forth that promises safety for the shipment of goods across the seas, and that ere long we shall be called upon for almost the limit of our resources in the way of foodstuffs and other necessities of life would seem absolutely certain.

In a word, we do not have to seek foreign markets. Foreign markets must seek us. Therein lies the security of our position.

And, in this dawn of great commercial promise for our country one section of it, the great West, is up and doing, ready to grasp the opportunity at hand. The genial sunshine of peace and prosperity is upon California. We, whose pleasure it is to make California our home, see no obstacles upon our path of progress. Our great Universal Exposition, by which we celebrate a world's engineering achievement, will suffer no material check from what is happening abroad. Official word has gone forth that the gates will swing open to the public on the date scheduled, February 20th of next year, and this word will be kept. Moreover, an optimist can see where the Exposition may gain, rather than lose, from the trouble across the seas. And in this connection we may quote Mr. B. C. Forbes, financial correspondent in New York of the San Francisco "Examiner":

"See America first," is the advice which many today bitterly regret they did not follow this year.

"San Francisco should draw to its gates next year an overwhelming army of tourists. Thousands heretofore afflicted with the European itch will next year hie themselves to the International Exposition, visiting on their way home some of the many great sights that this great and varied and richly favored land can show.

"I predict for this country a great wave of patriotism, a wave that will

change the popular course of travel, that will raise the demand for American products and send us forth to titanic commercial conquests in other lands."

Among the great institutions in California "Pacific Service" looks to participate in the coming era of unequalled prosperity and progress. There have been things "doing" in "Pacific Service" of late; things that while attracting the eye of the world generally have done much to strengthen our company's position at home. Along the lines of an up-to-date policy was the idea of offering to our stockholders an opportunity to come in with us in our scheme of expansion and purchase of our new pre-

ferred stock issue upon a plan heretofore unknown in transactions of the kind; it was in accord with a profit-sharing plan much in vogue among great employers of labor today that this offer to stockholders was extended to employees; it was in furtherance of a project to bring this profit-sharing idea closer and closer home that "Pacific Service" invite its consumers to come in with the others.

In all three phases the company's plan of finance has been successful. The fact, as stated elsewhere in this issue, that already it has resulted in doubling the number of stockholders is sufficient proof, to say nothing of the volume of shares applied for.



"MEDICINE FOR THE MIND"

Mr. Burnett Sheehan of the Auditing Department, the winner of the \$5 reward for the James Hugh Wise library motto, has returned the money, for the purpose of purchasing new books. A set of six volumes of Hawkin's "Electrical Guide" has been ordered.

Our local forecaster, Mr. George H. Willson of the U. S. Weather Bureau, is furnishing the monthly publication of the Climatological Data.

The U. S. Department of Labor has furnished several interesting pamphlets on lead and other poisoning.

The Department of Mines of Canada has sent in its yearly report profusely illustrated with colored maps.

Mr. Frank G. Baum kindly presented bound volumes of Davis' "Commercial Cyclopedia of the Pacific Southwest," "Electric Railways," by S. W. Ashe and J. D. Keeley; "Electrical Problems for Engineering Students," by W. L. Hooper and R. T. Wells, and "Electrical Designs," by American Electrician.



Mr. Stanley V. Walton has been selected to serve on the executive committee of the Commercial section of the

N. E. L. A. for the present year. Of the members of this committee, Mr. Walton is the only western representative. The chairman of the committee is Mr. E. L. Callahan of Chicago, manager of the New Business Department of the Byllesby interests.

At the N. E. L. A. meeting W. S. Coleman and Geo. B. Furniss got into a discussion. Some one remarked, "A queer combination—'Coalman and Furnace.'" Some one else commented, "I should say a 'Grate' combination."

"On Wednesday, July 29th," states Mr. Frank H. Varney, "our invitation to the Universal Craftsmen Council of Engineers, San Francisco Council No. 45, to visit Station 'A' in San Francisco was accepted by about twenty members. By the courtesy of Mr. Geo. C. Holberton, automobiles were supplied to convey the party to and from the station, and each auto carried one of the engineers of the Steam Section of the O. & M. Department to act as host. All of the party enjoyed the trip and many of them expressed surprise at the magnitude and general appearance of the station."

Our "Pacific Service" Section N. E. L. A. Bulletin

ERNEST B. PRICE, EDITOR

On Monday, July 20th, ground was broken for the National Electric Light Association convention to be held in San Francisco next year when our Mr. John A. Britton, in his official capacity as chairman of the conventions' committee of the N. E. L. A., called together a number of representatives of the electric light and power industry of the northern district of California at luncheon at the St. Francis Hotel in San Francisco, for the purpose of discussing ways and means to suitably entertain our brethern from the East and elsewhere.

Those present at the luncheon were: Dr. Thomas Addison, T. E. Bibbins, R. M. Alvord, A. G. Jones, Harry Russell, General Electric Company; E. B. Strong, A. H. Halloran, J. W. Redpath, Journal of Electricity, Power and Gas; W. W. Briggs, W. F. Neiman, Great Western Power Company; Edw. Whaley, Northern California Power Co.; Geo. Murphy, Pierson, Roeding Company; Guy L. Bayley, Department of Engineering of the Panama-Pacific International Exposition; J. G. DeRemer, United Light and Power Company; Thos. E. Collins, Westinghouse Company; W. L. Goodwin, Pacific States Electric Company; John A. Britton, Harry Bostwick, L. H. Newbert, Geo. C. Holberton, E. B. Price, W. S. Coleman, Geo. H. Bragg, W. G. Vincent, John D. Kuster, D. H. Foote, A. F. Hockenbeamer, Stanley V. Walton, F. S. Myrtle, S. J. Lisberger, E. C. Jones, F. G. Baum and P. M. Downing, Pacific Gas and Electric Company.

Mr. Britton announced the purpose of the meeting and secured promises of active co-operation from all present. S. J.

Lisberger, who with F. H. Varney, also of the Pacific Gas and Electric Company, was instrumental in securing the convention for San Francisco in 1915, described in detail the arrangements made for the comfort and convenience of visitors to the Philadelphia convention last month. The announcement was made that accommodations had already been secured for 300 guests to be distributed among the three leading hotels in San Francisco and that the San Francisco hotel bureau had arranged to care for nearly 1000 more.

The following are the subcommittees named by the chairman as the nucleus of an organization that is expected to work to beat all records in San Francisco next year:

Entertainment, W. W. Briggs and S. V. Walton; Finance, G. C. Holberton and Carl Heise; Hotel and Local Transport, F. H. Varney and Wm. Goodwin; Ladies' Auxiliary, T. E. Bibbins and J. G. De Remer; Local Registration, W. F. Neiman and C. J. Wilson; Meetings, S. J. Lisberger and R. J. Cantrell; Information Bureau, R. M. Alvord and Tom Collins; Press, A. H. Halloran and F. S. Myrtle.

No time is to be lost in getting the committees together and making a fair start. We realize that we will have to go some to equal, let alone to beat, the pace set by our brethern of the Quaker city this year; but we mean to do the best we can to show what is meant by true Californian hospitality.

The regular monthly meeting of "Pacific Service" section was held on the evening of July 10th at Native Sons' Hall in San Francisco. The feature of the

evening was an address by Mr. William J. French, Commissioner of the State Industrial Accident Board. Mr. French spoke of the "Workmen's Safety and Compensation Act." He explained not only the results this law was designed to accomplish, but, also, gave many interesting details as to its working. At the conclusion of Mr. French's talk a rising vote of thanks was tendered to him for his instructive address.

Prior to Mr. French's talk, Messrs. Frank H. Varney and S. J. Lisberger, who represented "Pacific Service" at the recent Philadelphia convention, described the efficient manner in which the convention had been handled by our brethern of the Quaker city. Thereupon Mr. John A. Britton, who has been appointed chairman of the committee on conventions for the National Association, addressed the gathering upon the convention to be held in San Francisco next year, declaring that California could not and would not allow herself to be outdone in hospitality, and expressing his confidence in the men of the West to worthily undertake the task of entertaining our visitors to the Exposition city.

Mr. Britton took occasion also to discuss the proposed Eight-hour and Prohibition laws, and uttered words of warning in pointing out the disastrous effect that the passage of these measures by the voters of California in November next would have upon the industries of the State.

The meeting was further distinguished by the presence of a number of gentlemen representing Harris, Forbes & Company, who for some time past have handled "Pacific Service" securities. The visitors included Messrs. Gilbert, H. A. Reeh, San Francisco representative; H. T. Grier, London; J. E. Barber, Philadelphia; C. S. Marshall, Boston; W. E. Bell and H. F. Beebe, New York. Mr. Bell acted as spokesman for the visitors in an address in which he expressed his surprise and delight in finding such an energetic body of men gathered together in the cause of

electricity. He stated that he considered "Pacific Service" section as no small asset of "Pacific Service."

Among those prominent in "Pacific Service," in addition to Mr. Britton, were Messrs. A. F. Hockenbeamer, Second Vice-President and Treasurer; D. H. Foote, Secretary; P. M. Downing, Engineer O. & M. Department, and M. H. Bridges, Auditor.

The first meeting of the N. E. L. A. subsection series was held on Friday evening, July 24th, at Native Sons' Hall under the direction of the Commercial section, Mr. L. H. Newbert presiding. If there existed any misgiving in the minds of the officers and the executive committee of the company section as to the advisability of holding more than one meeting a month, the meeting of the Commercial section cleared the atmosphere and demonstrated beyond all doubt that future meetings will be well attended. Our secretary, however, would like to see representatives from the Claims, General Agent, Land and Industrial departments more in evidence. There is a tremendous amount of work to be done by the company section this year and next, and the co-operation of every arm of the service is urgently desired.

The meeting was called to order promptly at 8 p. m. and after a few introductory remarks by Mr. Stanley V. Walton the proceedings progressed under the guidance of Mr. Lee H. Newbert, chairman of the Commercial section. Some interesting papers were read and discussed. Under the title of "Advantages of Being a Member of the Commercial Section," Mr. R. E. Fisher read a paper which called forth much favorable comment. In the course of this he said:

"The Commercial section should not be and is not confined to the commercial or sales department of this or any other company. Commercial relations and problems of consumer and company affect and influence the work of every individual and department in our organi-

zation, and it is, therefore, essential that all be familiar and in touch with commercial matters. This is made possible, to a great extent, through the medium of the Commercial section.

"We, the rising electrical generation, should deeply appreciate the great opportunity offered by the N. E. L. A. and the Commercial section in particular."

Mr. L. G. Galbraith read a paper on "Increasing Loads on Existing Lines," and brought out some very interesting and instructive facts.

Mr. Frank Talcott, in a paper on "Competition and How to Meet It," gave some sound advice. To quote:

"In dealing with the consumer do not take things personal, treat them in the same manner as you would want to be treated yourself. No matter how a complaint is registered, don't lose your tem-

per—and a consumer also. Be fair, and if there is a question of a doubt in your mind, give the consumer the preference of the doubt. Big and little complaints adjusted on this basis will lead to more business and more friends for the company than you ever thought of.

"To the salesman I would say: When you make a promise, live up to it; and to the employees handling this promise, help the consumer and the salesman by living up to it."

Mr. R. O. Adams spoke of general conditions in Oakland and how competition was met in the modern Athens. At the conclusion of the evening Mr. Newbert ably reviewed the papers presented and spoke of the work of the Commercial Department and its relation to the other departments of the company.

Gathering of the Clans at Philadelphia

By S. J. LISBERGER

In company with Mr. F. H. Varney, it was my privilege to be one of the delegates from this company to the Philadelphia convention, a gathering that will live long in the annals of the association as one of the most successful ever held. At the Bellevue-Stratford Hotel, the convention headquarters, 4400 delegates and representatives gathered from all points of the compass. On the second floor of the hotel the registration, hotel and information bureaus had their headquarters, in addition to which offices were provided for the President and Secretary of the Association, the Safety Committee and the Transportation Committee, at whose rooms tickets could be validated and railroad reservations obtained for return trips. In addition, there were three rooms provided for the Accounting, Commercial and Technical section meetings.

On the roof garden of the hotel the Exhibition Committee provided most excellent quarters for manufacturers' ex-

hibits, and much credit is due to both the committee and the exhibitors for the excellent exhibits provided. Here one could see all of the latest developments of the art in so far as it concerned small appliances and apparatus.

The Meter Committee and the Safety Committee also had quarters illustrating the latest products in their respective works.

At the first general session Mayor Blankenburg welcomed the convention to Philadelphia, following which President J. B. McCall delivered an address to the association. The president in summing up the work of the year made special mention of the achievements of the Accident Prevention Committee and, also, the Commercial section in issuing the Salesman's Hand-book; dealing as well with questions of public policy and governmental regulation. Space will not be taken here to speak of the various papers, nor of the reports of the special committees, as all of these will be available

to members in the published Proceedings of the Association; suffice it to say that the papers and reports of the meeting this year were, on an average, the best that have ever been presented.

One of the special features of the convention was the report of the Public Policy Committee, delivered by Mr. Samuel Insull. This report dealt in the main with public service commissions, the importance of fair rates and good service, safety and sanitation, hydro-electric development, public ownership and operation and industrial insurance. Following this report exercises were held in commemoration of the thirtieth annual meeting of the First International Electrical Conference and the First International Electrical Exhibition, which were held in Philadelphia in 1884. Addresses were delivered by men who participated in those epoch making events, among them being Mr. Samuel Insull, Mr. Chas. F. Brush, Mr. Frank J. Sprague, and Mr. E. W. Rice, Jr. Mr. Thos. Edison was on the stage but did not speak.

At this meeting there was exhibited Benjamin Franklin's static machine.

It will be interesting to note that of the twenty-five living past presidents of the association, seventeen were present at this convention.

As to entertainment. On Monday evening the president's reception was held in the main ball-room of the hotel, at which the orchestra of the Philadelphia section of the National Electric Light Association played. This orchestra was equal to any professional orchestra we have ever heard. On another evening an excursion was given to the Electrical Park in Willow Grove. About 2000 members took advantage of this entertainment, hearing an excellent concert and partaking of much amusement usually found in parks of this kind.

The Consolidated Gas and Electric Company of Baltimore gave an excursion to their McCall's Ferry hydro-electric plant.

All during the convention ample en-

tertainment was provided for the ladies in the way of excursions on the river, automobile tours through Fairmount Park, etc.

The convention came to a formal close on Friday, June 5th, at which final meeting Mr. Holton H. Scott of New York was elected president of the association for the ensuing year and the Executive Committee voted unanimously to hold the convention for 1915 in San Francisco.

It would be amiss not to give special mention to the Convention Daily, published for the National Electric Light Association by courtesy of the "Electrical World." This twenty-eight page paper issued every morning during the convention reported briefly the proceedings, incidents and programs for the day, including a register of those in attendance.

Too much credit cannot be given to the retiring president, Mr. McCall, and his entire staff for the excellent manner in which they handled the convention. The work of the Registration and Hotel Bureaus was well-nigh perfect. The entertainments and meetings moved without a hitch. Reception committees were provided at the railroad stations and at each hotel where convention delegates were housed. A request from the Entertainment Committee was practically a command.

Much credit is due also to the secretary of the association, Mr. T. C. Martin, and his staff, whose work did much to make the convention a record breaker.

The issue of "Current News" of the Philadelphia section of the National Electric Light Association gave to all visiting members an excellent idea of what the city offered and excellent views of the properties of the Philadelphia Electric Company. Ample facilities were provided for visiting the properties of the company.

Philadelphia is again to the front in that the Philadelphia Electric Company is installing two 35,000 k. w. steam-turbo units, the largest in the world today.



The Superintendent's Place in "Safety First"

TWENTY per cent of "Safety First" depends upon the superintendent. That is, out of every hundred points allowed on any safety work, twenty points depend upon the personality, mental attitude and point of view of the superintendent.

This is how the percentage works out, according to the United States Steel Corporation, the foremost advocate of "Safety First" in the United States:

Attitude of superintendent.....	20	per cent
Work of safety committees.....	20	" "
Inspections by workmen.....	5	" "
Instruction of workmen.....	15	" "
Prizes	9	" "
Signs	3	" "
Lectures	3	" "
Safeguards	17	" "
Lighting	5	" "
Cleanliness	3	" "

All of which make the attitude, or state of mind, of the superintendent one of the two most important elements in "Safety First." It equals in results all the labor of safety committees, and passes by three points all that can be accomplished by safeguards.

Think what that means! In "Pacific Service" the last six months something like \$10,000 has been spent on safeguards. And yet that expenditure must of necessity produce three per cent less in results than could be produced by a "Safety First" attitude, or point of view, on the part of our superintendents.

The reason? It is this:

The care exercised by workmen largely enters into the number of accidents, and the only way the number of accidents due to carelessness can be reduced is by the development of habits of caution. The burden of doing this rests entirely upon the superintendent in charge. His attitude necessarily is the attitude of his men, from his foremen to the newest apprentice. It is reflected by the workmen, just as his attitude towards operation and production is reflected. If the superintendent treats the matter lightly, his foremen and his workmen treat it lightly. If he shows a desire to make working conditions safe and to have precautionary rules observed—if he makes the prevention of accidents one of the most important features of his department—then his foremen reflect that feeling and see that their men “work safe,” and the men themselves look for safety in themselves and in their fellow workmen. In other words, the workmen follow their leader as they expect and are expected to do. They think safety and do safety as far as he does. They reflect him, his state of mind, his point of view.

An example will give you the effect of a superintendent's indifference to “Safety First.” A piece of rush work was being done on a big enterprise. The superintendent in charge ordered it done a certain way; a workman objected, saying, “I don't think it is safe to do it that way.” The superintendent having no mind for safety, and having before him only his own importance, and a desire to get the work done hastily, answered, “Who in h— is running this job, you or me?” The workman dropped back into place; did as he had been ordered; the accident he feared followed and he was instantly killed.

A “Safety First” attitude on the part of that superintendent would have saved a life. Incidentally, it would have showed him a man big enough to take a suggestion from a man beneath him—in short, a man fit to be a superintendent.

J. P. C.



“Getting Ready for 1915”

By THOMAS E. FOGALSANG, O. & M. Department, Steam-Electric Section, San Francisco

WITH the announcement that the electric power for the Panama-Pacific Exposition would be supplied by this company came the problems of the Engineering Department as to how best to take care of this large increase in load for that period without incurring an unnecessary outlay of capital or, worse still, being left with a lot of idle or useless apparatus after the Fair is over.

It was decided, finally, that whatever apparatus should be installed would fit into the company's present system, so that when the Exposition has finally passed into history each cable, line, or piece of apparatus will take its permanent place of usefulness as a fixed part of “Pacific Service.” Nearly all of the expositions of the past have been supplied by steam plants, installed as exhibits by the manufacturers. The one exception was the Pan-American at Buffalo, which being the market for the Niagara Falls power was taken care of by that great institution, and with excellent results. The Panama-Pacific will be cared for by both hydro-electric and steam plant service, and no better combination could be imagined.

Station “A” in San Francisco will be the steam plant that will deliver service to the grounds through a substation there. Three long cables will cross the city, these being joined by a fourth that will leave one of the down-town substations. To take care of the increased load at this station without the installation of further turbine or boiler capacity has called into action all the ingenuity at the command of the engineer of Operation and Maintenance and his department. Close study has been made of the efficiency problem and everything brought up to the highest standard. It was found that more salt water for the condensers would maintain a higher vac-



T. E. Fogalsang

uum at the larger loads, consequently it became necessary to enlarge the pumping plant. This was done by an addition to the old building and, likewise, to transformers, switching apparatus and new pumps. This station is

now a model in its line.

After a turbo-generator has been in service for some time, it becomes necessary to take it down for cleaning purposes. If there were no such thing as dust this would not be necessary. The field of such a generator acts as a large fan and practically draws in all dust and dirt that comes near it. This is deposited in the air ducts, which, in time, stop up, with the result that the machine runs at greatly increased temperatures, and consequently at reduced loads. Just how often these machines should be cleaned is a matter that engineers are still debating. At Station “A” this year, two such machines have been overhauled and cleaned. One of these, of 12,000 k.w. capacity, had been installed for a period of three years and three months, and had operated under load seventy-five per cent of the time. It may be interesting to know that, contrary to expectations, this machine was not dangerously dirty and could have been run another year without fear of bad results.

The general appearance of the interior of the station has been improved by a coat of paint.

A new switch-house has been planned by the Engineering Department of Electric Construction, and work started upon it. It is something that has long been needed, as the growth of the local load has left the switching apparatus of a decade ago obsolete.

Superintendent Eastwood has become a strong advocate of “Safety First” and is following out all of the recommendations of the company's Safety Engineer.

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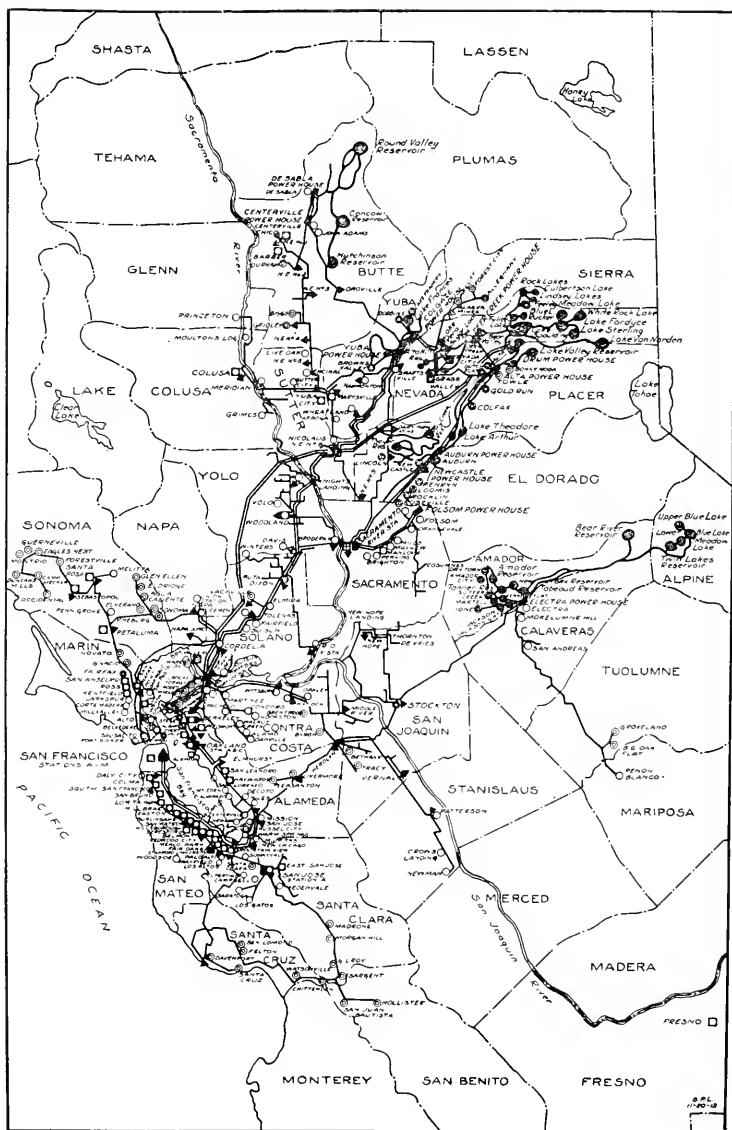
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PACIFIC GAS AND ELECTRIC COMPANY

CITIES AND TOWNS SUPPLIED WITH GAS,
ELECTRICITY, WATER AND RAILWAY

SERVICE FURNISHED	NUMBER OF CITIES AND TOWNS SERVED BY COMPANY			TOTAL POPULATION
	DIRECTLY	INDIRECTLY	TOTAL	
Electricity.....	152	62	214	1,221,123
Gas.....	49	2	51	1,124,893
Water (Domestic).....	14	14	28	58,905
Railway.....	1	...	1	75,602

Place	Population	Place	Population	Place	Population
Alta.....	27,000	Forestville.....	100	Palo Alto.....	6,300
Alameda.....	20	Felton.....	300	Pacheco.....	200
Alamo.....	50	Fresno.....	40,000	Penryn.....	250
Albany.....	800	Folsom.....	1,800	Patterson.....	300
Alhambra.....	293	Gidroy.....	2,000	Pearl Grove.....	300
Alhambra City.....	200	Glen Ellen.....	500	Perkins.....	50
Alhambra John.....	200	Gold Run.....	100	Petaluma.....	5,500
Alto.....	25	Grass Valley.....	4,500	Piedmont.....	1,720
Alviso.....	200	Gridley.....	1,800	Pike City.....	200
Angel Island.....	280	Grimes.....	250	Pineole.....	1,500
Antherton.....	250	Groveland.....	125	Pittsburg.....	2,372
Auburn.....	2,375	Guerneville.....	500	Pleasanton.....	2,000
Agua Caliente.....	100	Hampton.....	500	Point San Pedro.....	20
Alvarado.....	900	Hawthorne.....	4,000	Port Costa.....	600
Antioch.....	3,000	Hillsborough.....	1,000	Redwood City.....	3,200
Arboga.....	100	Hollister.....	3,000	Richmond.....	10,000
Barber.....	500	Hookston.....	75	Rio Vista.....	884
Belmont.....	350	Hignacio.....	100	Rocklin.....	1,000
Ben Lomond.....	200	Hone.....	900	Roseville.....	2,600
Belvedere.....	1,000	Irvine.....	1,000	Rodeo.....	500
Benicia.....	3,360	Jackson Gate.....	100	Ross.....	500
Beresford.....	25	Jackson.....	2,035	Russell City.....	250
Berkeley.....	53,000	Kennedy Flat.....	20	Sacramento.....	75,602
Bethany.....	200	Kendall.....	250	San Andreas.....	200
Biggs.....	750	Knights Landing.....	350	San Anselmo.....	1,500
Big Oak Flat.....	20	Knightsen.....	125	San Bruno.....	1,500
Brightwood.....	200	Lake Francis.....	5	San Carlos.....	100
Brighton.....	200	Lafayette.....	100	San Francisco.....	530,000
Broderick.....	200	Lathrop.....	300	San Jose.....	37,946
Brown's Valley.....	50	Live Oak.....	200	San Leandro.....	4,000
Byron.....	200	Livermore.....	2,250	San Lorenzo.....	100
Burlingame.....	4,300	Los Gatos.....	3,000	San Mateo.....	6,500
California City.....	25	Larkspur.....	600	San Quentin.....	2,500
Camp Meeker.....	200	Lincoln.....	1,400	San Rafael.....	6,000
Campbell.....	600	Lomita Park.....	100	San Ramon.....	25
Centerville.....	1,000	Los Altos.....	500	San Pablo.....	1,000
Centerville.....	20	Loomis.....	1,000	Santa Clara.....	6,000
Chico.....	13,000	Madison.....	250	Santa Cruz.....	16,000
Collinsville.....	150	Madrone.....	125	Saratoga.....	50
Colma.....	3,500	Maletta.....	30	Santa Rosa.....	10,500
Colusa.....	1,500	Manlove.....	50	Sebastopol.....	1,200
Concord.....	1,500	Martinez.....	5,000	Sausalito.....	2,500
Consumers.....	50	Martell.....	150	Sheridan.....	130
Cement.....	1,500	Marysville.....	7,000	Smartsville.....	500
Colfax.....	500	Mayfield.....	1,500	South San Francisco.....	2,500
Cordelia.....	150	Mayhew.....	50	Stanford University.....	2,600
Corte Madera.....	350	Menlo Park.....	1,500	Sonoma.....	1,200
Crockett.....	2,500	Meridian.....	300	Steger.....	1,000
Crow's Landing.....	375	Millbrae.....	300	Stockton.....	35,000
Cupertino.....	50	Mills.....	50	Suisun.....	1,200
Daly City.....	250	Milltown.....	300	Sutter City.....	150
Danville.....	250	Mill Valley.....	2,500	Sutter Creek.....	1,500
Davis.....	750	Mission San Jose.....	500	Sunnyvale.....	1,500
Decoto.....	350	Mokelumne Hill.....	150	Tiburon.....	400
de Salas.....	25	Monte Rio.....	50	Torrey.....	20
Dixon.....	1,000	Morgan Hill.....	500	Towle.....	100
Dolbinn.....	50	Moulton's Landing.....	30	Tracy.....	1,200
Davenport.....	1,000	Mountain View.....	2,500	Union Station.....	40
Drytown.....	20	Mr. Eden.....	200	Wacaville.....	1,200
Ducham.....	500	Mare Island.....	500	Waihele.....	13,600
Dutch Flat.....	500	Napa.....	7,500	Vineburg.....	200
Duncan's Mills.....	150	Nevada City.....	2,700	Walnut Creek.....	350
Earle's Nest.....	50	New Chicago.....	10	Warm Springs.....	200
Easton.....	300	Newcastle.....	750	Watsonville.....	4,500
Edenvale.....	500	Newman.....	1,000	Wheatland.....	1,400
Eldridge.....	500	Niles.....	800	Winters.....	1,200
Elmira.....	150	Nippon.....	75	Woodland.....	3,200
El Verano.....	400	Nobara.....	250	Woodside.....	200
Electra.....	50	Novato.....	215,000	Yolo.....	400
Emeryville.....	5,000	Oakland.....	80	Yuba City.....	1,200
Encinal.....	100	Oakley.....	400		
Fairfax.....	500	Occidental.....	100		
Fairfield.....	834	Orange Vale.....	100		

Unmarked—Electricity only.

—Gas only.

—Gas and Electricity.

—Gas, Electricity and Water.

—Gas, Electricity and Street Railways.

EMPLOYS approximately 5,000 people.
OPERATES 10 hydro-electric plants in the mountains
4 steam-driven electric plants in big cities
17 gas works.

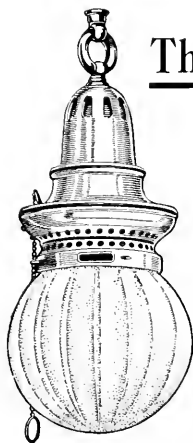
Electricity and Water

Electricity supplied through other companies

Gas supplied through other companies

Water supplied through other companies

SERVES 1/3 of California's population.
40 of California's 58 counties
An area of 37,775 square miles
1/4 the size of New York State
1/2 the size of all the New England States combined



The Lamp that Bridges the Gap

Humphrey "20" Double Standard Mantle Lamp

Equipped with eight-inch Dif-
fuso Globe. Fitted with a
burner or head for two regular
No. 8 Inverted Mantles. No
inner cylinder required.

*Consumes eight to nine cubic feet of
gas per hour.*

General Gas Light Company

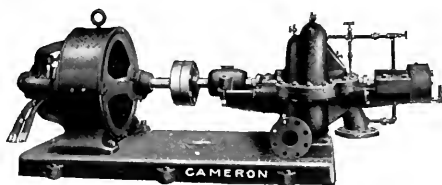
SAN FRANCISCO, CAL.

KALAMAZOO

C. B. BABCOCK, Manager

NEW YORK

CAMERON PUMPS



SIMPLE :: STRONG :: RUGGED

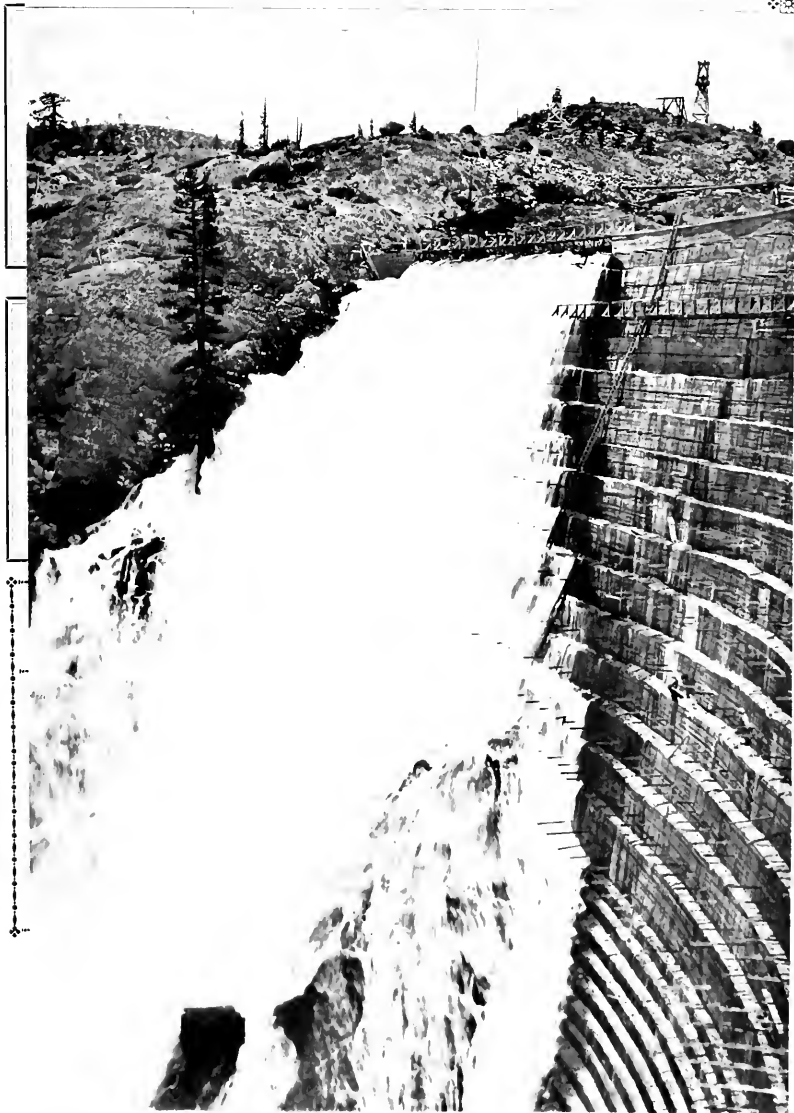
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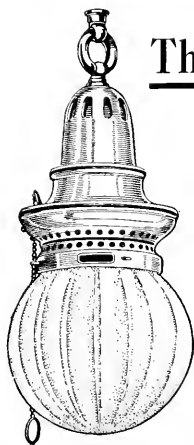
PACIFIC SERVICE MAGAZINE



SEPTEMBER • 1914

Published Monthly by the Pacific Gas and Electric Co., San Francisco, Cal.

No.
1



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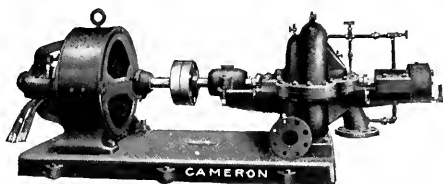
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PACIFIC SERVICE MAGAZINE



Vol.
6

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Published Monthly by the Pacific Gas and Electric Co., San Francisco, Cal.

The Pacific Telephone and Telegraph Company

GOOD SERVICE AT FAIR RATES

Reports

Construction

Designs

J. G. White Engineering Corporation

ALASKA COMMERCIAL BUILDING
SAN FRANCISCO

First National Bank Bldg.
CHICAGO, ILL.

43 Exchange Place
NEW YORK, N. Y.

London Correspondents:
J. G. White & Company, Ltd.
9 Cloak Lane, London, E. C.

Pacific Service Magazine

VOL. VI



No. 4

Yearly Subscription \$1.50

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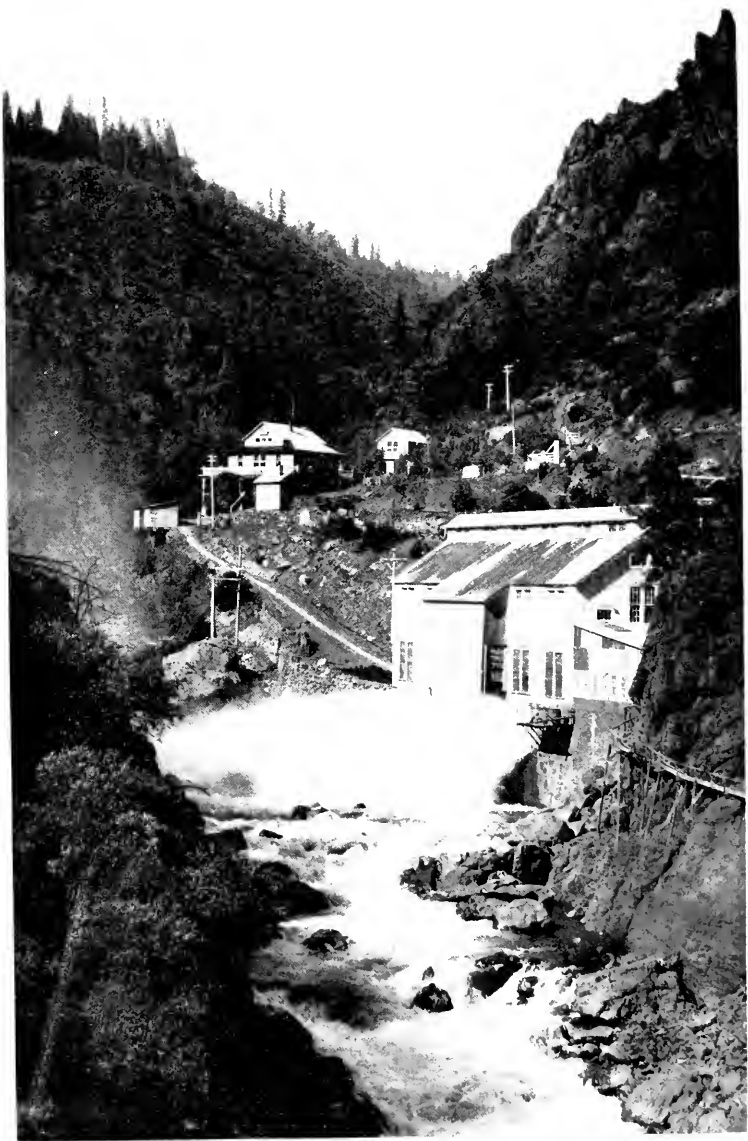
Contents for September

Special Exploitation Number

DE SABLA POWER-HOUSE	Frontispiece
PROFIT-SHARING BY EMPLOYEES AND CONSUMERS; AN ALMOST UNIQUE FEATURE OF PUBLIC UTILITY DE- VELOPMENT	John A. Britton . . 111
"PACIFIC SERVICE" AS AN ORGANIZATION	113
A LETTER FROM THE TREASURER TO ONE OF OUR STOCKHOLDERS	A. F. Hockenbeamer 131
EDITORIAL	136
PRESS COMMENTS AT HOME AND ABROAD	138
DIRECTORY OF COMPANY'S OFFICIALS	i
MAP OF COMPANY'S SYSTEM	ii
CITIES AND TOWNS SUPPLIED BY "PACIFIC SERVICE".	iii

Index to Advertisers

Allis Chalmers Mfg. Co.	vi	Pelton Water Wheel Co.	x
Associated Oil Co.	v	Pierson, Roeding & Co.	viii
Byron Jackson Iron Works.	ix	Remington Typewriter Co.	vii
Chaplin-Fulton Mfg. Co.	ix	Roebling's, John A., Sons Co.	xii
General Electric Co.	xi	Schaw-Balcher Co.	x
General Gas Light Co.	iv	Sprague Meter Co.	v
Halsey, N. W., & Co.	4th page cover	Standard Underground Cable Co.	ix
Harron Rickard & McCone.	v	Steiger & Kerr Stove & Foundry Co.	viii
Johns-Manville, H. W., Co.	vii	Westinghouse Electric & Mfg. Co.	3d page cover
Mark-Lilly Co.	xii	White, J. G., Engineering Corporation	2d page cover
Pacific Telephone & Telegraph Co.	2d page cover	Wood, R. D., & Co.	vii
Patrick & Co.	x		



DE SABLE POWER-HOUSE.
Capacity, 18,000 h. p. Located on Butte creek, Butte county, California.

Profit-Sharing by Employees and Consumers; an Almost Unique Feature of Public Utility Development

By JOHN A. BRITTON

AS corporations have increased in numbers and importance, the obligations of corporations to their employees and consumers have also increased, and plans for the benefit of employees and consumers are being constantly worked out through the several accepted methods of profit-sharing, pensions, welfare work and other schemes of like purport.

It has been felt that in, perhaps, a humanitarian sense alone, both employees and consumers should be participants in every way possible in the success of the corporation with which they are associated.

Employees and consumers on the Pacific Coast have been such participants in the past in the direction of a general increase in wages and a decrease in the hours of labor, obligations of working conditions and in the cost of commodities.

The statistics of the Pacific Gas and Electric Company establish that in the past fifteen years employees have secured a reduction of 75 per cent in hours of labor worked and an increase of 50 per cent in compensation, while the cost of the commodities which the company supplies to the communities it serves has been reduced, by voluntary reductions, approximately 50 per cent. The consumers as well as employees have therefore been real participants in the material success of the company. These reductions of costs and increase in compensation, however, do not altogether fill the measure of perfect harmony as between a company and its employees and consumers, and the principle has been adopted in many cases of pension plans and welfare work. It has remained, however, for the Pacific Gas and Electric Company to set a new standard of participation in its success by inviting its employees and consumers to become actual partners in the enterprise through the holding of its stock.


When the new plan of financing the company by the recent issuance of the first preferred stock received the

unqualified endorsement of the Railroad Commission of California, it occurred to the officials of the company that no better disposition of the stock could be had than to have its ownership rest as largely as possible with the employees and consumers of the company, and while stockholders of record were given preference on the first subscriptions a sufficient number of these, who felt that the participation of employees and consumers would be of material benefit to the company, agreed to share with such employees and consumers.

The general banking interests of the state co-operated with the company in receiving subscriptions from employees and consumers, and a total amount of approximately \$1,500,000 in subscriptions was obtained from both these sources, and a total of about 2500 stockholders thereby added to the roster of stockholders of the company.

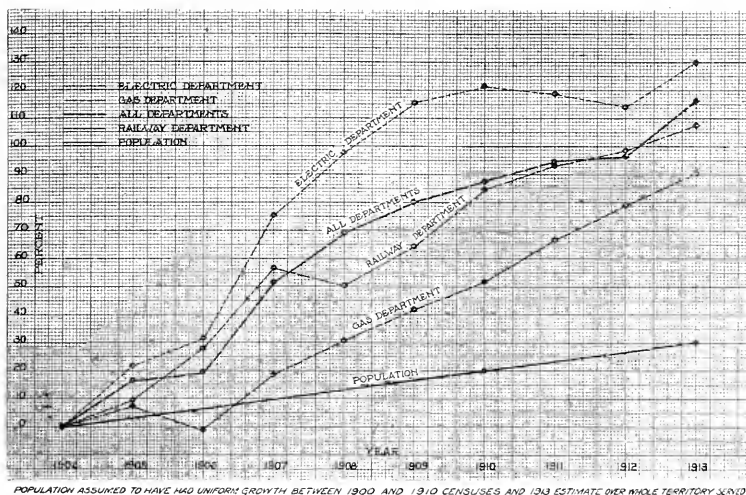
The participation of consumers as stockholders in a public utility is rather unique in the annals of financing. Its ultimate good to both the consumer and the public utility cannot be overestimated. It is a tribute to the record of the Pacific Gas and Electric Company that its consumers to the extent named expressed their confidence in the management of the company; and in these trying times of more or less financial stress and world disturbing conditions it is also a tribute to the employees and consumers, that by their frugal habits they have been enabled to save out of their earnings sufficient moneys to become stockholders to the extent named.

It has always been the aim and ambition of the officers of the Pacific Gas and Electric Company to have that company classed as a California institution, doing its business with and distributing its profits among the people of this state, and by this move of participation that long cherished hope becomes a certainty. There is apparently no good reason why, instead of looking to the central money markets of the United States, commonly referred to as Wall Street, for financing, the Pacific Gas and Electric Company may not in the future, by the added confidence gained through the addition of its California stockholders, be able to largely finance itself among its own people.

A large, stylized handwritten signature in dark ink, likely belonging to a company officer, is positioned at the bottom right of the page. The signature is fluid and cursive, with a prominent loop at the end.



Some of the principal office buildings owned by the company. Reading from the top down, left to right: Public office on the ground floor of the head office, 115 Sutter street, San Francisco; the company's Oakland headquarters, Thirteenth and Clay streets; the head office building in San Francisco; interior of "Pacific Service" headquarters in Sacramento, Eleventh and K streets; exterior of the building.



the average holding of bonds being about \$5,600.

The number of consumers, as of December 31, 1913, distributed among users of gas and electricity, steam and water, is given: Gas, 208,269; electricity, 132,355; water, 8,511; steam, 282; total, 319,417.

Regarding the cities and towns in the territory covered by its operations, the Company serves 125 with electricity directly and 49 indirectly (i. e., its electricity supplied through other companies); total number of cities and towns supplied with electricity, 174; total population, 1,217,438. It supplies 47 cities and towns directly with gas and 2 indirectly; total, 49; total population, 1,121,568. With water for domestic purposes, it supplies 9 cities and towns directly and 11 indirectly; total 20; total population, 58,710. It owns as well as operates one street railway system, that in the city of Sacramento, where the population is given at 75,602. Among the cities so served are eight of the eleven largest in the state, namely, San Francisco, with a population of 530,000; Oakland, with 215,000; Sacramento, with 75,602; Berkeley, with 53,000; Fresno, with 10,000;

San Jose, with 37,946; Stockton, with 35,000, and Alameda, with 27,000. A fair indication of the current rate of increase in the population of central California is afforded by recent government statistics which credit San Francisco with a growth of 31,590 and Oakland with a growth of 36,803 within the last three and one-half years. Government estimates to date give the State of California a population of 2,757,859, with a gain of 380,310, or 16 per cent, in the past three and one-half years. It should not be necessary to state here that with this growth, particularly in that section of the state in which the Pacific Gas and Electric Company operates, will be greatly stimulated by the opening of the Panama Canal and by the International Exposition to be held in San Francisco in 1915.

The climate of California has been compared with that of Italy, and with that and its wonderful variety of extensive natural resources, the possibilities of its future development may be valued as almost limitless. It has been estimated that with its area of 158,000 square miles, it is capable of comfort-

ably supporting as large a population as the country in the Old World just mentioned, which supports a population of 32,500,000 within an area of 110,000 square miles.

SCOPE OF THE ELECTRIC DEPARTMENT

In its electric department, the Pacific Gas and Electric Company operates 10 hydro-electric plants in the mountains, with an aggregate installed capacity in horsepower of 123,740, and 4 steam electric plants in big cities, with a total installed capacity in horsepower of 110,188. The total amount of electricity, therefore, which the Company is in a position to furnish to its consumers from its own generating plants is 233,928 horsepower. These figures are taken from the report of the Company's operations for the year closing December 31, 1913. At the same date the total length of its transmission lines was 5,090 miles, of which 1,531 miles represented high tension lines, 3,484 overhead distribution lines and 75 miles of underground conduit. Statistics furnished by the electric distribution department give the

number of electric substations at 146, the number of street lamp arcs 6,721, the number of incandescent street lamps 21,321, and the total connected load on the system, in horsepower, 425,783. During the year 1913 the gross revenue from sales of electricity was \$8,230,781.91, classified as follows:

Commercial and residential business, \$3,642,836.95; state, county and municipal business, \$662,566.21; power supplied to the agricultural industries, \$419,092.83; to the mining industries, \$557,461.76; to the transportation industries, \$696,324.41; to the manufacturing industries, \$1,476,104.59; supplied to other electric light and power corporations, \$343,429.94; miscellaneous sales, \$431,337.41; temporary lighting and power, \$1,627.81; total, \$8,230,781.91.

Statistics show that in the past six years the Company's gross revenue from the sales of electricity has increased \$1,914,153. During the same period the number of its consumers of electricity has increased \$76,651, or 138 per cent. A portion of this increase undoubtedly is due to the growing use of electric

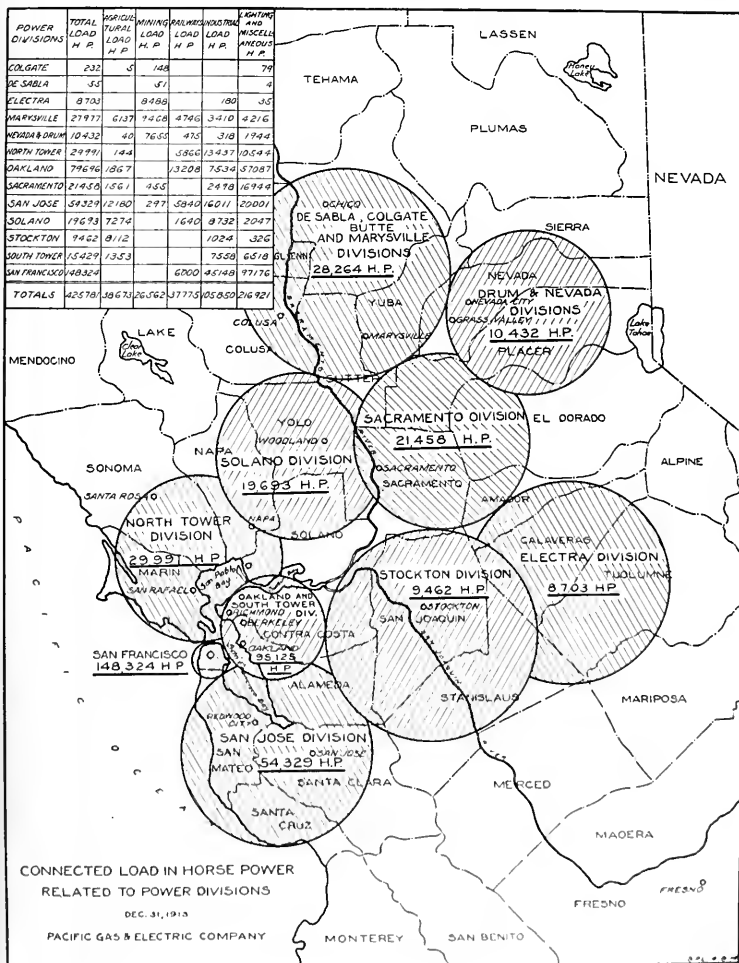


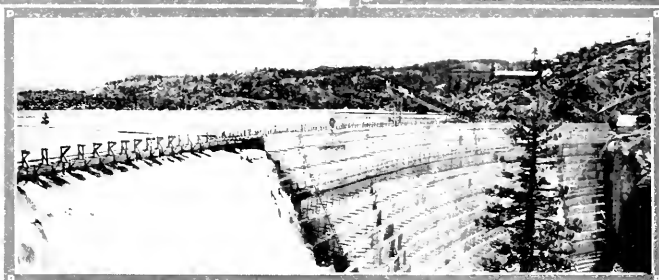
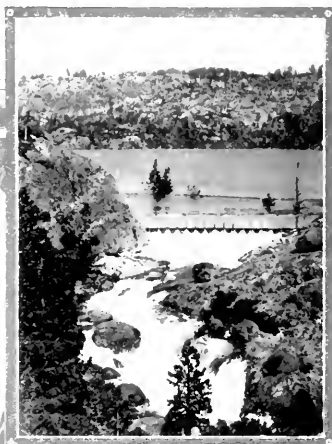
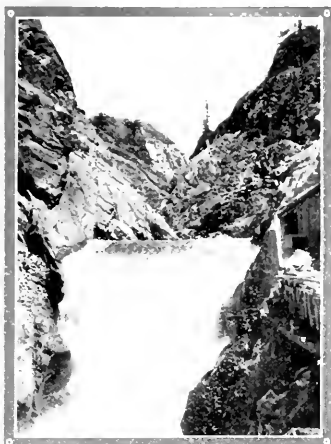
What reclamation can do. Virgin tule lands are seen in the foreground, with reclaimed lands under cultivation beyond.

power for irrigation, reclamation, the operation of power machines, etc. The Company's gross earnings from this source have, within a few years, risen from practically nothing to \$419,092 in 1913. The possibilities of future growth in the direction of irrigation and reclamation, subject, of course, to seasonal

fluctuations, may be inferred by contrasting the acreage at present wholly or partially served by the Company, which is estimated at 300,000 acres, with the total arable acreage contiguous to its lines, as shown in the accompanying map.

Another source of increased revenue is found in the general utilization of





Water views in the company's hydro-electric system. Reading left to right, from the top downward: The lower dam below Lake Spaulding, showing intake of old South Yuba flume; the north spillway on Lake Spaulding; Lake Spaulding dam; Lake Fordyce, the parent reservoir of the South Yuba system; head waters of old Boardman canal, Bear valley.

electricity for household purposes, especially for cooking. Modern improvements in devices and appliances are bringing electricity more and more in demand for domestic purposes, particularly in the smaller towns and rural districts where gas is not available.

Since the organization of the Company its entire electric system has been welded into what is virtually a single operating unit, all of the various plants being so interconnected and controlled that it is possible, in case of accident or variation in load, to switch very quickly from one to another of the various power-houses and transmission lines. This insures continuity of service throughout the entire field of operations, and is an important element of strength, particularly in view of the necessity of uninterrupted service to the many important industries dependent upon the Company for power.

THE SOUTH YUBA-BEAR RIVER DEVELOPMENT

Quite recently the Company accomplished an important piece of construction work which has materially added to its electric power resources. For a number of years prior to the close of 1913, "Pacific Service" was handicapped by its inability to supply from its own plants a sufficient amount of hydro-electric energy to meet the ever increasing demand and was compelled to meet the deficiency partly by extensive purchases of power from other companies and partly by the more costly steam-electric generation. So, with the view of rendering itself independent of

all outside sources of supply and to provide for the future growth of its business in such fashion as to enable it to meet all demands and, at the same time, at a minimum cost, the Company two years ago undertook the development of its available water-power rights on the South Yuba and Bear rivers, in the summit region of the Sierra Nevada. The permission of the State Railroad Commission having first been secured, work was begun July 30, 1912, at Lake Spaulding, one of a chain of storage reservoirs owned by the Company in the heart of the Sierra, the idea being to dam the South Yuba river below the lake and by diverting the waters thereby impounded into the Bear river valley below to take advantage of the fall of the water on its way down the valley for power developing purposes. The Company's engineers had surveyed the territory and had figured out a chain of six developments at various stages between Lake Spaulding and the town of Auburn, a total fall of about 4500 feet, with an aggregate capacity of 190,000 horsepower. The authorization of the State Railroad Commission having first

been secured, work was begun on July 30, 1912, and by Thanksgiving Day, 1913, Lake Spaulding dam had been completed to a height of 225 feet above stream-bed, the connecting tunnel and canal had been built, the first power-house, called Drum power-house after the President of the Company, erected in the Bear river gorge nine miles below Spaulding, all the necessary machinery installed and an initial development of 33,333 horsepower of elec-



A section of Drum canal.



tricity was sent humming along a completed steel tower line stretching between Drum and the Company's great power-distributing station at Cordelia, near the shores of San Francisco bay, a distance over 110 miles.

According to estimates up to December 31, 1913, approximately \$7,000,000 was expended on the hydraulic work, generating plants and steel-transmission line. This, however, must be taken as a first cost, for it has been estimated that whereas the present expenditure as stated has resulted in the development of 33,333 horsepower, subsequent expenditures of substantially no greater amount will yield an additional 157,000 horsepower. The present capacity of Drum

station is to be doubled and five additional power-houses are to be constructed, and as the new units may be installed without a corresponding increase in investment for dams, ditches and other hydraulic work, the total investment for horsepower as the work progresses must decrease considerably. For instance, the next section of the work to be undertaken will double

the power now available but will add only 22 per cent to the present investment. This is true, perhaps, of most hydro-electric installations of this size and character; at any rate, it is believed that the ultimate cost of the South Yuba and Bear river developments will rank them as the most economical of their type and magnitude in the United States.

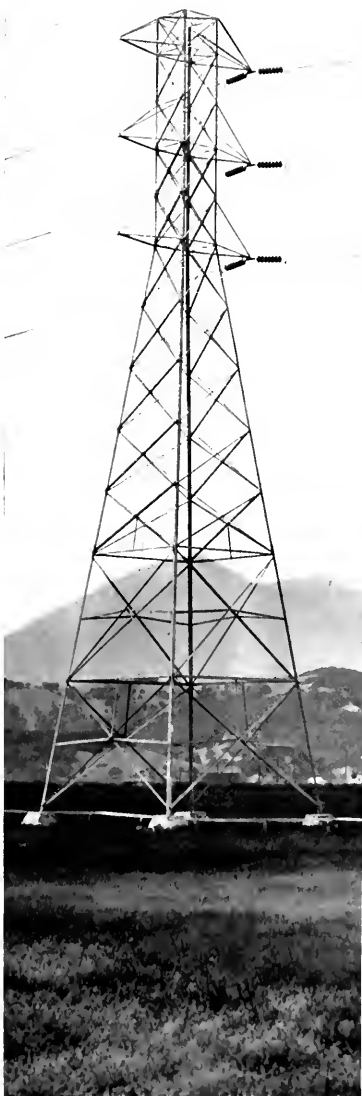


Uppermost picture is of South Tower, at Crockett, where the 60,000 volt lines cross the bay from the company's main distributing station at Cordelia, seen in the second picture. At the bottom is the Ridge station, on the hills above Berkeley, where the high-tension lines end their cross-country journey.

Meanwhile, Drum power-house is steadily delivering electric current into the system of "Pacific Service" and is expected to add approximately \$400,000 to the net revenues of the Company this year, simply through reducing operating expenses and irrespective of any new business that may be taken on.

An incidental feature of this development will be the utilization of the water, after it has passed through six power-houses and has performed its function of generating electric energy in each, for the irrigation of about 45,000 acres of deciduous fruit land. The Company has owned and operated an extensive irrigation system for a number of years, and through the new development this promises to be a profitable feature of its business. The following figures should be of interest to those interested in hydro-electric development:

Area of South Yuba watershed, 120 square miles; present height of Spaulding dam, 225 feet; ultimate height of Spaulding dam, 305

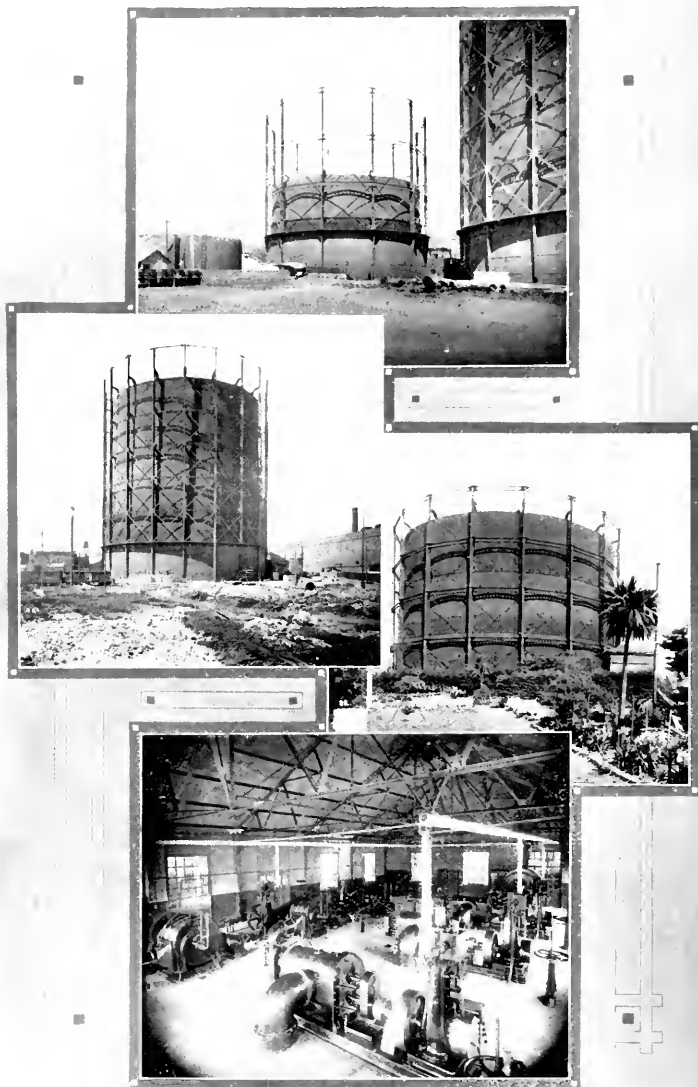


"Pacific Service" steel tower near San Rafael, Mt. Tamalpais in the background.

feet; present capacity of Spaulding dam 43,500 acre feet; ultimate capacity of Spaulding dam, 97,000 acre feet; concrete in present Lake Spaulding dam, 153,806 cubic yards; number of power-houses using same water, 6; difference in elevation between Lake Spaulding and last power-house, 4,585 feet; combined effective head of water at all power-houses, 4,216 feet or 0.8 miles; present capacity in operation, 33,333 horsepower; ultimate capacity, on 70 per cent load factor, 156,250 horsepower; ultimate capacity with additional installation for peak-loads, 190,750 horsepower; length of new steel-tower transmission line, Drum to Cordelia, 110 miles; distance Drum power-house to Berkeley via new and existing lines, 133 miles.

STEAM GENERATION OF ELECTRICITY

Concerning the generation of electricity by steam, as already stated the steam stations are four in number. The largest one is that in San Francisco, where there are three turbines, two



Gas department views, San Francisco. Reading from top downward these are: 1,000,000 cubic feet holder, Potrero; 5,000,000 feet holder, Potrero; 2,000,000 feet holder, North Beach; exhaustor building, Potrero.

of 20,000 and one of 16,000 horsepower capacity. With the smaller engines the total capacity of the station in horsepower is 72,388. Oakland comes next with 28,150 horsepower, Sacramento next with 6,700 and San Jose fourth with 2,950.

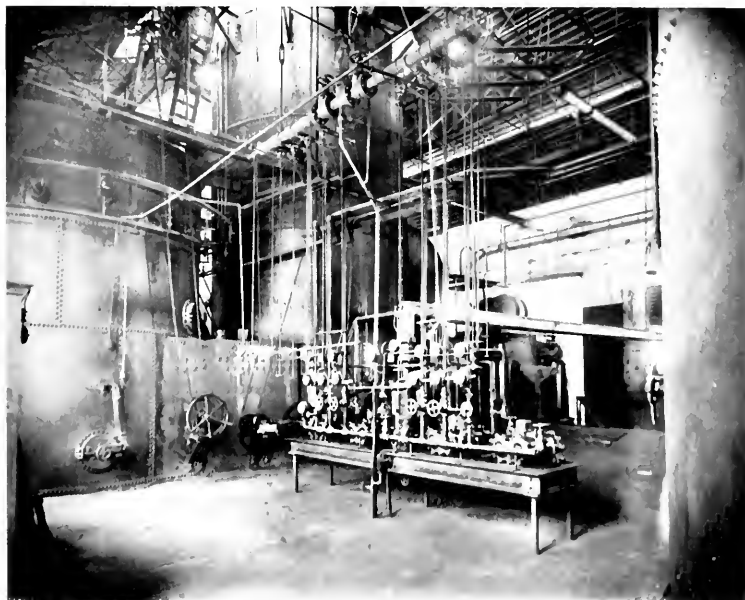
The record for 1913 shows an aggregate output from these four stations of 115,244,960 kilowatt hours. California crude oil is used for boiler fuel and during 1913 the total amount of oil used by the steam electric stations was 529,378 barrels, an average of 217.68 kilowatt hours per barrel.

GAS DEPARTMENT AN IMPORTANT DIVISION

The Pacific Gas and Electric Company's Gas Department is a very important division of its system, on account of both its scope and its revenue-producing capacity. The climate of California, both in the coast cities and in the interior

valleys, is well adapted to the development of a large gas business, especially for cooking and heating; in addition to which, the generally high retail prices for other fuels, such as coal and wood, encourage this development. For the same reason, gas is being used in a constantly increasing degree for industrial purposes. One consumer of this class alone uses more than 20,000,000 cubic feet of gas per annum.

The Company manufactures its gas exclusively from crude oil under a process developed by its own staff. As is the case in the steam-generation of electricity, oil is found easier as well as more economical to handle than coal, besides being cleaner and giving more satisfactory results. It should not be necessary here to inform our readers that the production of crude oil in California has risen enormously in recent years, from

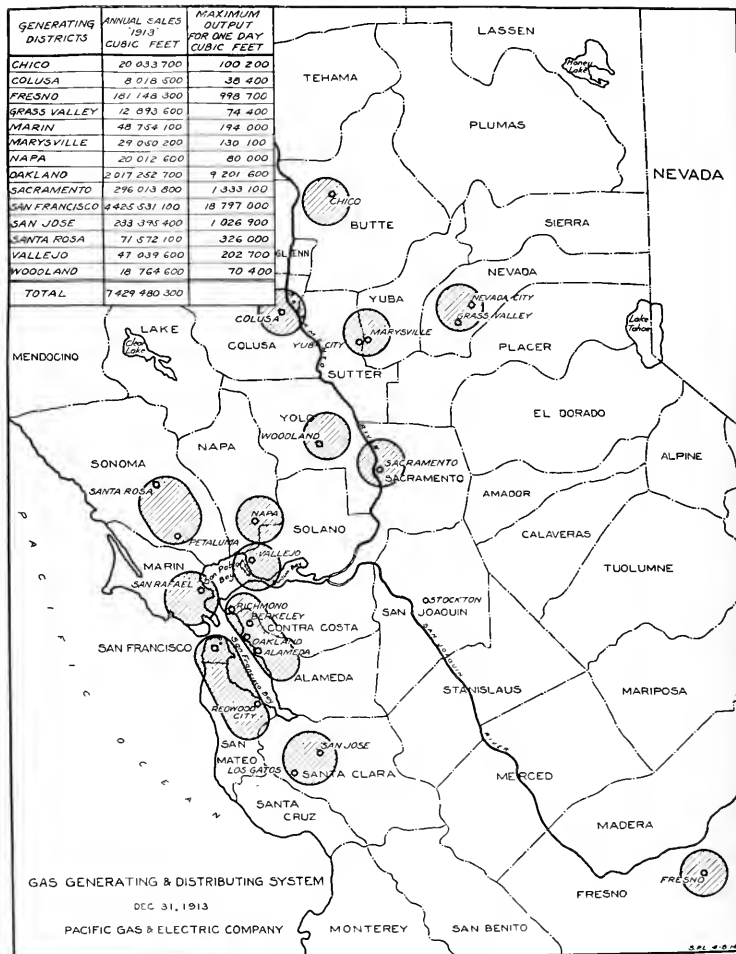


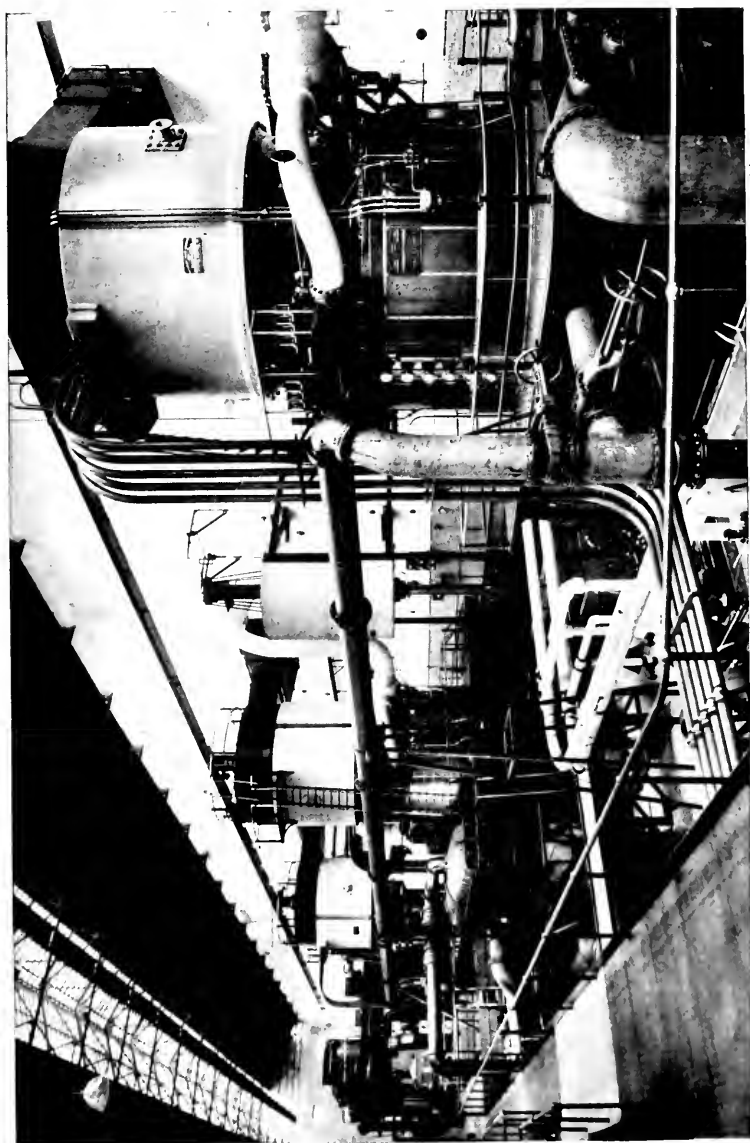
Sixteen-foot Jones oil-gas set, with gas-makers' tables.

678,572 barrels in 1887 to about 95,000,000 barrels in 1913, with the result that California now leads the United States in oil production. Furthermore, this supply appears to be inexhaustible, so that as the facilities for transportation and delivery are excellent and the Company's supply is assured to it, under very favor-

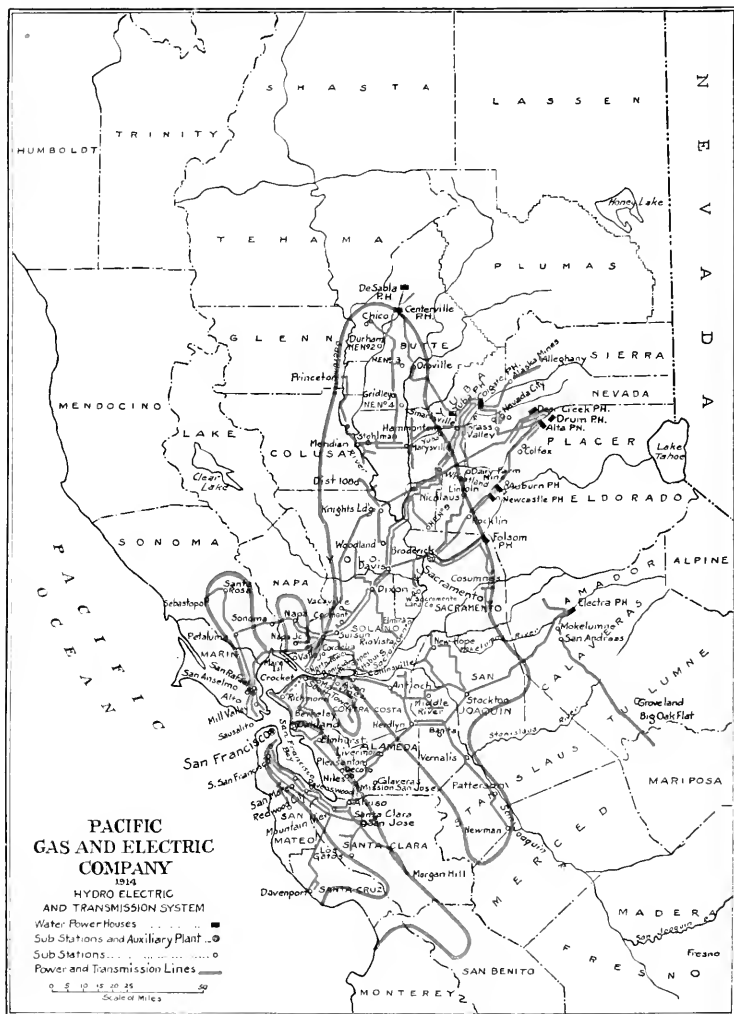
able terms, under a long term contract, this item in the list of operating responsibilities appears to be well taken care of.

The Company operates 17 gas plants, distributed over its territory all the way from Chico in the north to the southernmost limit at Fresno. With these plants, aided by a system of high and low pres-





Left to right in Station No. 1, San Francisco, showing installation of two 15,000 K.V.A. Curtis turbines.



Map of Central California, in which, in addition to showing the lines of the Pacific Gas and Electric Company's hydro-electric and transmission system, there is delineated an area of some 7,000,000 acres of land that is susceptible of irrigation or reclamation through the use of cheap electric power.



Office of old North Beach Gas Works, adjacent to Exposition grounds. Now used by "Pacific Service" and by both Gas and Electric Departments.

sure mains aggregating 2,374 miles in length, the Company supplies 49 communities with gas. The 17 gas plants have a total daily generator capacity of 44,710,000 cubic feet. Our readers may turn to the accompanying chart for a comprehensive idea of what the Company is doing in the generation and distribution of this very useful commodity.

The record for 1913 shows a total of 7,430,000,000 cubic feet of gas sold, with a gross revenue therefrom of \$6,517,595. As already stated elsewhere the number of the Company's consumers of gas at the close of 1913 was 208,269.

SACRAMENTO STREET RAILROAD SYSTEM

As before stated, the Pacific Gas and Electric Company owns as well as operates the street railway system in the

city of Sacramento. Sacramento is the capital of California, the fourth city of the state in point of population, and the financial and commercial center of the Sacramento valley; in addition to which, it is an important division point for two transcontinental railroads and is the terminus of three extensive interurban systems.

The Company operates this street railroad system with electric power supplied from its plants. Large expenditures have been made in recent years for extensions, improvements and betterments. During the year 1913 the total number of passengers carried on this system was 12,508,711, an average of 34,270 passengers per day. The gross revenue from this service was \$572,913. The system includes 12 miles of street railroad track and 60 cars.

WATER BUSINESS A THRIVING ONE

For reasons which have already been made clear the Company's water business is increasing daily. For domestic purposes it, at this time, supplies 20 cities and towns, four from wells by pumping plants and the remainder with water from hydro-electric plants in the mountains brought down to the points of consumption by gravity canals. The most important of the cities supplied is Stockton, a thriving community of 35,000 people, where during the year 1913 the average daily consumption for the year was about 4,000,000 gallons. The pumps used in the Stockton system are electrically operated.

HIGH STANDARD IN SALARIES AND WAGES

The Company believes in making its employees contented and comfortable, and in following out this policy it is careful not to fall behind in the matter of salaries and wages. The record for

1913 shows the average number of the Company's employees in all departments to have been 6,778; the total amount paid out in salaries and wages was \$6,955,817, an annual average compensation per employee of \$1,026. In this connection we present to our readers the following figures obtained from the United States census bureau, showing the average compensation of employees in central electric light and power stations and in the gas industry in the entire United States and in California:

Commercial electric stations (1912): Average compensation of employees in the entire United States, \$779; in the State of California, \$1,018; wages higher in California by 30 per cent. The gas industry record as taken for the year 1909 shows: Average compensation per employee over the entire United States, \$657; in the State of California, \$879; wages higher in California by 34 per cent.



"Pacific Service" irrigation ditch near Auburn, in Placer County.

FRANCHISES AND WATER RIGHTS

Recent decisions of the United States Supreme Court in California cases have been of the utmost importance to public utilities all over the United States in securing to them certain vested rights which materially enhance the values of their properties. In a case decided last April it was held that franchises secured under the authority of the State Constitution prior to its amendment in October, 1911, franchises under which this and other companies are supplying gas, electric light and water to a large number of municipalities, are vested property rights of perpetual duration and include the right of making all necessary extensions within such municipalities under the terms of the original grant.

Under the law as it now stands no franchise of any description may be granted except upon the condition that the utility pay therefor at least 2 per cent of its gross annual receipts derived from the exercise of such franchise. Also, in case of cities governed by freeholders' charters more onerous conditions still are imposed upon the grant of franchises. So that the importance of this decision of the supreme tribunal of the United States will appear at once when it is understood that the franchises under which our Company operates are not only without time limit but are not subject to any specific rental, charge or burden of any kind. It is worthy of mention, also, that counsel for the Pacific Gas and Electric Company participated in the argument upon this important case.

Another very important decision was that of the Supreme Court of the United States, also given in last April, in a San Joaquin County action, in which the court held that water-rights are properly, the value of which must be considered in the fixing of rates by the public authorities. This decision, like the other, is of immense importance to our Company for the reason that it at the present time owns water-rights within

the territory covered by its operations of a total horsepower capacity, developed and undeveloped, of 381,000.

OPEN AND ABOVE-BOARD DEALING

The Company has established a policy of open and above-board dealing with the public and its official representatives. Since the day when the supervision of the public utilities of the State was given into the hands of the State Railroad Commission the Pacific Gas and Electric Company has co-operated heartily with the Commission in its solution of all problems affecting its business. The Company believes in proper regulation as being to its own best interests as well as those of the public it serves. It has been the general experience of utilities operating in states where regulation is sane and intelligent that their securities have advanced in the Company's investments so that capital has been more readily attracted to their enterprises.

WORKMEN'S COMPENSATION ACT.

The State Legislature of 1913 enacted a Workmen's Compensation Act concerning which there has been more or less discussion. Our Company up to the present time has had but limited experience of its working, but it recognizes the justice of its underlying purposes and believes that the means and methods it provides for the settlement of claims of injury and disability to employees, while proving more satisfactory to employees than any preceding act or system, will not prove unduly burdensome to the Company in the future.

Months before this act went into operation the Company inaugurated a "Safety First" campaign, in connection with which the Company employed prominent experts from the East to inspect its properties and investigate the hazards involved in its operating system. Our readers will be pleased to know that the report as entered by the experts was of the most satisfactory character.



Attractive substations in the company's electric distributing system. The topmost view is of an Oakland substation; next comes one in Woodland; next one in San Mateo; next is Station "D," Bush street, near Larkin, San Francisco.

A Letter From the Treasurer to One of Our Stockholders

SAN FRANCISCO, CAL., September 3, 1914.

MR.
San Francisco, California.

Dear Sir:

In your letter of August 28th, you express yourself as being very much interested in our offering of First Preferred Cumulative 6% Stock, and have asked me to give you an analysis of this security from an investor's standpoint.

As a purchaser of corporate securities, with many years of experience, you have undoubtedly trained yourself to look for certain fundamental requirements in deciding whether a security is worthy of your confidence. I believe, therefore, you will agree with me that every cautious investor should satisfy himself as to the following points which, to use your expression, "constitute the essential features of a sound and conservative investment."

1st. Well demonstrated and increasing earnings which should be not only sufficient to pay the annual dividends on the security but should have a margin of safety, over and above the dividend requirements, to insure the regular payment of the dividends under all circumstances.

The annual reports of the Pacific Gas and Electric Company, particularly the report for the year 1913, have made the earnings of the Company since its organization in 1906 available to the public in detail, and, for the past three years, over the certificate of independent auditors, namely Messrs. Price, Waterhouse & Company, certified public accountants.

The following statement, which is a compilation for each of the past five years ended July 31, 1914, will indicate to you very clearly that the earnings of the Company have not only grown steadily from year to year but that in each one of these years the revenue available for dividends on the new preferred stock has been largely in excess of the required amount. Generally speaking, a bond is regarded as a safe investment if the issuing corporation can show that it is earning at least twice its bond interest. In fact, a great many bond issues which are regarded as high class investments have a smaller margin of safety, with respect to earnings, than this. You can readily see from an examination of this earnings statement how much stronger even than this is the protection which our first preferred stock has with respect to earnings.

Year Ended July 31st	Gross Revenue	Net Revenue	Net Revenue after Bond Interest and Discount	Annual Dividends on New Preferred Stock	Balance Available for Dividends on Junior Stock Issues and for Depreciation Reserve
1910	\$14,011,612.57	\$6,062,145.22	\$3,079,127.90	\$750,000	\$2,329,127.90
1911	14,425,705.29	6,316,249.61	3,185,680.91	750,000	2,435,680.91
1912	14,600,747.78	6,336,918.64	2,823,428.04	750,000	2,073,428.04
1913	15,512,375.97	6,404,306.92	2,533,854.60	750,000	1,783,854.60
1914	16,882,779.99	7,815,104.05	3,817,510.08	750,000	3,067,510.08

2nd. Intrinsic property value well in excess of the total of the security issue.

Before authorizing security issues, the Railroad Commission of the State of California requires proof to be submitted to it of the intrinsic value of the property back of the security for the issuance of which authority is sought by the utility.

The commission, as you may know, not only has authorized the issuance of this stock but took occasion to commend our plan of junior financing as being worthy of emulation by other utilities. For your information I may add that the appraised value of our property is substantially in excess of the full liquidation value of \$100 per share of this new stock.

3rd. Franchises extending well beyond the maturity of the security issue.

The following paragraph from our 1913 annual report will show you that for all practical purposes the franchise question may be regarded as non-existent with respect to this Company:

"By its unanimous decision of April 6, 1914, in the case of *Russell v. Sebastian*, in the argument of which counsel for this Company participated, the Supreme Court of the United States established the fact, beyond any further question, that the franchises secured under the authority of the State Constitution prior to its amendment on October 10, 1911, under which this Company is supplying gas and electric light and water in the large number of municipalities served by it, are vested property rights of perpetual duration and include the right of making all necessary extensions within such municipalities upon the terms of the original grant. By a general law of the State, no franchise of any description may now be granted except upon condition that the purchaser pay at least two per cent of the gross annual receipts derived from its exercise. In the case of cities governed by freeholders' charters, the conditions upon which franchises are granted, are in general more onerous than those prescribed by this general law of the State. The importance of this decision will, therefore, be more fully appreciated when it is considered that the above mentioned franchises of this Company are not only without time limit but are also not subject to any specific rental, charge or burden of any kind."

4th. Earnings derived from a growing and diversified business and which will consequently not be materially affected by depression in any one industry.

The following statement will show you the diversified character of the Company's business:

DERIVATION OF GROSS REVENUES PAST SEVEN YEARS

SOURCES OF GROSS REVENUE						PERCENTAGE OF TOTAL GROSS REVENUE FROM:				
Year	Electricity	Gas	Railway	All Other	Total	Elec-tricity	Gas	Rail-way	All Other	Total
1907	\$6,316,629	\$4,086,372	\$431,800	\$507,339	\$11,342,140	.56	.36	.04	.04	100
1908	7,059,088	4,494,945	414,326	688,946	12,657,305	.56	.36	.03	.05	100
1909	7,678,665	4,860,034	452,396	500,193	13,491,288	.57	.36	.03	.04	100
1910	7,899,224	5,202,284	509,152	433,936	14,044,596	.56	.37	.04	.03	100
1911	7,823,903	5,735,219	533,520	511,967	14,604,609	.54	.39	.04	.03	100
1912	7,672,570	5,805,865	547,187	719,029	14,744,651	.52	.39	.04	.05	100
1913	8,230,782	6,547,595	572,913	851,047	16,202,337	.51	.40	.04	.05	100
Gain 6 years	\$1,914,153	\$2,461,223	\$141,113	\$343,708	4,860,197					

There has been a very satisfactory growth in each line of activity, and at no time has it been a case of having to rely for the payment of charges and dividends upon one department to offset deficiency in another, although from the standpoint of the security purchaser the ability to maintain the stability of revenues in this way is a factor of much importance. During the seven months ended July 31, 1914, our electric business increased \$311,155 and our gas business increased \$322,374. I merely mention this to lend point to the statement that while the possibilities of the future development of the electrical industry are universally recognized, no such general recognition has obtained with respect to the gas industry. In my opinion, which is supported not only by the foregoing figures, but by daily observation, the possibilities of the growth of the gas business are fully as great as in the electrical department. This is largely due to the increasing use of gas for cooking and industrial purposes, but more particularly to its use for the heating of homes, apartment houses and other buildings in their entirety. Two things are responsible for this. One is our moderate California climate, which brings this method of heating within economical limits, and the other is the development of convenient and economical gas heating systems and devices. It may be of interest to you to learn that a large number of the buildings on the Exposition grounds are being heated, or will be heated, entirely by means of gas. As already stated, our climate is largely responsible for this, and where such a system in colder localities would be a luxury which very few could afford, it is within the reach of people with moderate means in California.

5th. A growing territory for the Company's business field and one which is sufficiently extended and diversified so that earnings will not be materially affected by depression or by some catastrophe in any particular city or other locality.

The Pacific Gas and Electric Company operates in a territory of approximately 37,000 square miles, and in this territory serves a very large number of cities and towns, as shown in the following table:

SERVICE FURNISHED	NUMBER OF CITIES AND TOWNS SERVED BY THE COMPANY			TOTAL POPULATION
	Directly	Indirectly	Total	
Electricity.....	152	62	214	1,221,123
Gas.....	49	2	51	1,124,893
Water (Domestic).....	14	14	28	58,905
Railway.....	1	.....	1	75,602

That the business field of this Company is one which has in the past grown steadily in population and in the development of new industries is known to you not only from personal observation of central and northern California, but is also attested by the growth in our gross revenues from year to year and by the large numbers of consumers added to our system.

In the seven years from 1906 to 1913, our business increased \$7,255,175, or at the annual rate of \$1,036,453.

In the last fiscal year the increase was \$1,457,686, and in the seven months ended July 31, 1914, it was \$681,441.

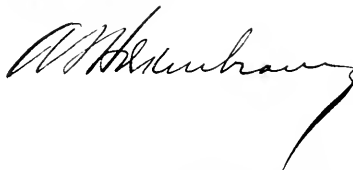
In the last seven years (ended June 30th) the number of our consumers has grown from 162,544 to 358,288, an increase of 195,687, or an average annual increase of 27,955 customers. During the last of these years the growth was close to 30,000.

6th. Safeguards to insure additional issuance of securities only for purposes that will add to the value and earning capacity of the property.

One of the things that has given investors confidence in bonds as an investment has been the vigilance of banking houses handling bond issues in properly safeguarding future issues. What the bankers have done in the past for bonds in this respect is now being done by the Railroad Commission. Under the Public Utilities Act of California, issues of this First Preferred Stock can be made only with the authority of the Railroad Commission for acquisitions, extensions, betterments and the refunding of existing obligations. The Commission also fixes the price at which this stock may be sold, and not only requires information to be presented to it as to the purposes for which the money realized from the sale of this stock will be used, but also requires monthly reports to be rendered to it showing in detail for what purposes the money has been expended. This insures to the investor the continuance of a safe and conservative relation of property values to any additional issues of preferred stock which may be put out.

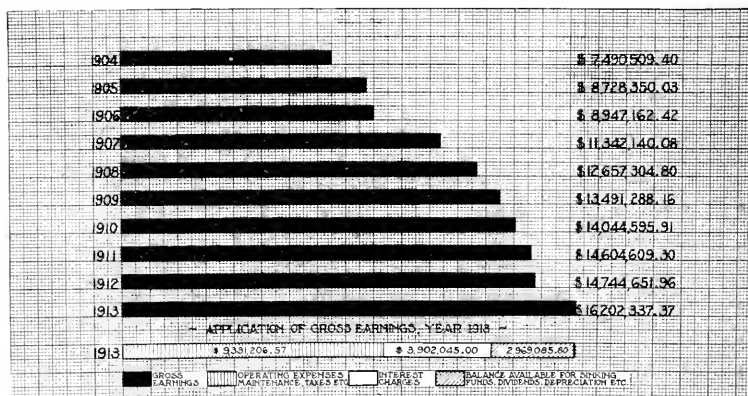
Trusting that the foregoing will satisfactorily answer your inquiry, I am,

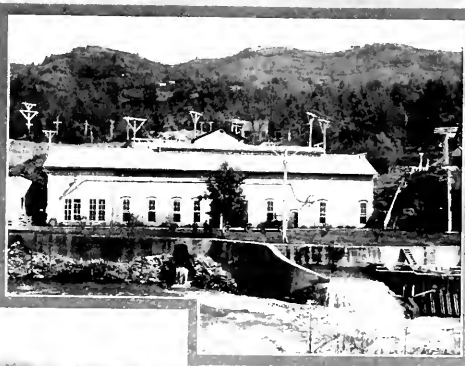
Very sincerely yours,



Second Vice-President and Treasurer.

GROWTH OF GROSS EARNINGS GRAPHICALLY SHOWN





Power plant views. Reading from top downward: Centerville power house, on Battle creek; Drum power house, Bear river, showing 137-foot incline; interior of Drum power house, with present equipment; company's boarding house at Ellettsville, on Mokelumne river.

Pacific Service Magazine

PUBLISHED IN THE INTERESTS OF ALL EMPLOYEES OF
THE PACIFIC GAS AND ELECTRIC COMPANY

JOHN A. BRITTON - - - EDITOR-IN-CHIEF
FREDERICK S. MYRTLE - - - MANAGING EDITOR
A. F. HOCKENBEAMER - - - BUSINESS MANAGER

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at 445 Sutter Street, San Francisco

The Pacific Gas and Electric Company desires to serve its patrons in the best possible manner. Any consumer not satisfied with his service will confer a favor upon the management by taking the matter up with the district office.

VOL. VI. SEPTEMBER, 1914. No. 4

EDITORIAL

For this one issue PACIFIC SERVICE MAGAZINE is diverted from the path of journalistic routine and is presented to its readers in the form of what may be termed an exploitation number.

Those who have followed the fortunes of "Pacific Service" in the later stages of its ever-increasing development will understand the purpose of this. Recent events have brought about a greater degree of intimacy between our organization and the public it serves than ever before existed. In these days of extensive publicity, when the people demand, and rightly, nothing short of unreserved candor on the part of the public utilities they support, it is not uncommon for a corporation such as ours to publish, in some form or other, comprehensive information concerning its system, its scope of operations and other matters upon which the public has a right to be informed. But, it is always a question whether, as a general thing, pamphlets, folders or other forms of publicity commonly resorted to for the purpose stated succeed in finding their way into the right quarters, always, whether they are not liable to miss the object aimed at in places where it is of the greatest importance to score hits. The method of their circulation is usually of the scattering order, for one thing. Besides, they are

so nearly uniform in their make-up that they are liable to lack the distinctiveness which attracts.

Now, in view of the recent events referred to, of which there has been much written and said and concerning which the public press all over the country has been eloquent, those whose business it is to direct the affairs of the Pacific Gas and Electric Company have felt it advisable to circulate the fullest possible information concerning "Pacific Service" as an organization, its system, its resources, its financial obligations, its present and potential development, its part—in a word, in the scheme of things within the territory covered by its operations.

Most of our readers are already aware that by the successful outcome of the plan of permanent financing which had its beginning in Mr. John A. Britton's letter to the stockholders on June 3d last, the number of persons holding shares in our enterprise is now double what it was in that beginning. The subsequent extension of the offer conveyed by Mr. Britton's first letter, to include not only the company's employees but, also, its consumers, has borne fruit in a great awakening of interest in the affairs of "Pacific Service" at home; in other words, the increase in the number of stockholders means that Californians, residents of the territory in which "Pacific Service" operates, have joined force with us to the number of some thousands, and that we are in a fair way to be a Home Industry in every sense of the word, home-owned as well as home-operated.

We feel that we owe something in the nature of an open expression of our appreciation to those who have so substantially demonstrated their implicit confidence in our understanding and in us. To have put into successful operation a plan of finance of the magnitude involved is no small achievement, surely, at a time when nearly one-half of the world is steeped in the blood of an awful war and the realm of finance is in the worst disturbed condition it was ever

known to be. We are justly proud of that achievement and we are justly grateful to those who made it possible.

Then, again, it is the mission of PACIFIC SERVICE MAGAZINE to circulate information concerning new and interesting features of its development and the progress of events in the various sections of its territory, and in the doing this its distribution, at first confined to employees, has for some time past taken in the company's stockholders, at home and abroad. Within the past two months the number of those stockholders, as already stated, has doubled, and it is but fitting that our new friends should be placed on an equality with our old friends in knowledge of the workings of the organization of which they are now a part.

So this September issue as an exploitation number was planned, and our readers will see that it serves a double purpose, that of expressing to those interested all that we feel concerning the more than generous response made by our stockholders, employees and consumers to our call upon them to rally round the standard of "Pacific Service," and that of comprehending in an enduring form—for we hope and expect that bound copies of this, our house-organ, will occupy a place on the book shelves of our members and patrons and will do for ages to come—an accurate analysis of our system as it stands at present as a whole and in the various sections of its organization.

Features of our exploitation number include an introductory article by Vice-President and General Manager John A. Britton, who as head of the entire operating system of "Pacific Service" is familiar with every detail of the system from one end to the other. Following his article is a descriptive account of "Pacific Service" as an organization, an account which in the main is a synopsis of the annual report presented to our stockholders at the close of the fiscal year ending June 30, 1914. Then Mr.

A. F. Hockenbeamer, our Second Vice-President and Treasurer, presents in an open letter a comprehensive review of the financial status of our company. It fell to Mr. Hockenbeamer to work out the details of the plan of finance the successful operation of which is now assured. Interspersed through the reading matter are a number of carefully selected views illustrating the working of "Pacific Service." We venture to hope that our readers will find the entire number both interesting and instructive.

THE ELEVATOR MAN SAYS:

It seems to me that the world is all ups and downs.

Some go to the top.

Others stay in the basement.

Some get off and on at intermediate stations.

People don't always stay fixed at top or bottom.

More men look in the mirror and smirk than women.

Women smile more than men do.

That people who stand in the center are selfish.

If a man or woman smiles and says good-morning and good-night, their digestion is good.

If you are going down too fast put on the safety brake.

Too great a load carried causes breakers to fly out and you can't go up or down.

Don't crowd, it only annoys the other fellow and you don't arrive any quicker.

Press Comments at Home and Abroad

PACIFIC GAS AND ELECTRIC REPORT- ING LARGE EARNINGS.

NET FOR JULY MORE THAN \$212,000 IN
EXCESS OF NET FOR CORRESPOND-
ING MONTH OF 1913

Announcement that Pacific Gas and Electric Co. had received subscriptions in excess of \$8,750,000, or more than 70 per cent of its offering of \$12,500,000 6 per cent first preferred stock at 82½, was good news to the public utility men.

While all of them believed that in normal times there would have been no difficulty in carrying out the refinancing plans of the company, it was deemed extremely doubtful if, under present conditions, the company would receive the required amount of subscriptions to make the plan operative. The subscriptions were received from more than 3,000 persons, many of whom are new holders of the company's securities, and the number of stockholders of the company has doubled since the close of the last fiscal year.

Much of the old preferred stock and considerable of the common is held abroad, and while at first the foreign holders did not take kindly to the plan, officials of the company near the end of July succeeded in securing the promise of subscriptions from a large amount of foreign stock. Then came the war, and these foreign subscriptions were not made. It is probable that by the close of the year all of the \$12,500,000 stock will be sold, especially in case security markets open. While it is probable that the price to future subscribers will be advanced, it is believed the stock will be taken up.

One of the features of the subscriptions were the large amounts taken by employees and customers of the company. Employees subscribed for more than \$550,000, and while the company did no soliciting of consumers, beyond sending them the circulars describing the new issue, the last report showed that they had taken over \$600,000 of the new stock. Because of the disturbed condition of the financial world, the company has deferred for one month

payment of the second installment on the new stock, and also dates of payment of the third and fourth installments have been put ahead. Much of the new stock was paid for in full at the time of subscription, and many other subscribers have notified the company that they will pay in full on delivery of the permanent certificates, which are being prepared as rapidly as possible.

Earnings of the company continue to show well, and a steady reduction is being made in operating costs. Net earnings of the company for July, 1914, were in excess of \$212,000 more than in July, 1913. It is now expected that in the current year the company will earn in excess of the estimate of \$3,800,000 net income, after bond interest made at the time of announcement of the new financial plan the surplus for twelve months ended July 31st was \$3,817,510.

Success of the new plan means much to the bond and stock holders of the company. The large additional equity behind the general mortgage bonds means, without doubt, an advance in their price, as the fact of the new financing being done by the sale of preferred stock is quite a bull card for those bonds. From the proceeds of the new stock will be paid off the \$7,000,000 one-year notes maturing March 25, 1915, and certain other obligations, aggregating about \$1,000,000, or \$8,000,000 in all of floating debt. By the sale of the remaining first preferred stock, working capital will be provided, and it is expected that after all notes and floating debt have been provided for, that almost \$3,000,000 working capital will be available.

In addition, the company will have in its treasury, for further investment, \$5,000,000 general and refunding bonds which are available for sale at any time at a price to be fixed by the Railroad Commission. These bonds will be released by the payment of the one-year notes. The \$5,000,000 debenture bonds also deposited behind the notes will be canceled.

Sinking fund charges will be cared for under an order of the Railroad Commission by the issue of common stock, at par, to reimburse the treasury of the company for expenditures made for sinking fund. The commission has authorized the issue of common stock for this purpose for the current year. The directors announce that, beginning with the first quarter of 1915, dividends will

be resumed on the \$32,000,000 of common stock, at the rate of one per cent quarterly, which will be increased as earnings increase. The company has plans for making a much broader market for the common stock and the new first preferred stock.

Holders of the \$6,000,000 old preferred stock, which will be junior to the new first preferred until July 1, 1916, may, after that date, exchange it for the first preferred stock on the basis of ten shares of the old preferred for 10¼ shares of first preferred.

Wall Street (N.Y.) Journal, August 26, 1914.

GAS CONSUMERS BECOME GAS PARTNERS.

A new trail through the jungle of finance has been blazed by the Pacific Gas and Electric Company of California. Financiers all over the United States have been following the pathfinders with the keenest interest. Other corporations, with the stuff to stand the test, are likely to follow the Pacific Coast leaders.

At a time when the markets of the world were upset and new financing plans seemed almost suicidal the Pacific Gas and Electric Company came boldly forward and offered to take their customers into partnership. Such an offer, particularly at such a time, had never before been made in the history of American corporations.

Seasoned financiers shook their heads and waited. But the Pacific Gas and Electric Company needed \$12,500,000 for immediate use. They had the stuff back of it, but the money markets were closed tighter than drums to new financing of the character desired.

"The money is right here among our consumers in California," said A. F. Hockenbeamer, vice-president and treasurer, to the directors of the company. The directors agreed that the money was here, but they were more or less skeptical of Mr. Hockenbeamer's ability to get it.

But they decided to take a flier into this unexplored field of finance. So an issue of \$12,500,000 of new first preferred stock was announced to consumers of the company in a circular issued July 24, 1914. That was only three weeks ago and just when the great war was brewing and just about ready to break. The time did seem to some of the directors as most inauspicious. But look what has happened:

Up to noon today subscriptions to the new stock had been made of approximately \$9,000,000.

Nearly 3,000 new stockholders have been enrolled on the company's list, practically doubling the shareholders' list of six months ago.

The board of directors has held a meeting and announce today that the financial plan whereby customers become partners is now operative.

Proving both that good news travels fast and that financiers throughout the country are keenly interested in the outcome of the company's financial venture, telegrams of congratulation began to pour into the company's offices this morning. Here is a sample from an eastern banker:

"I congratulate you upon accomplishing the best bit of financing I ever heard of."

This was the tenor of them all.

Mr. Hockenbeamer this morning modestly disclaimed credit for originating a new plan of financing.

"It only proves," he said, "that there is lots of money here if the right kind of stuff is offered. We had something to offer that everybody could stand behind, from the Railroad Commission down to the humblest subscriber. It would have been suicidal to have offered anything else."

Among local consumers who have subscribed to the new stock issue of the Pacific Gas and Electric Company are bankers, lawyers, doctors, merchants, jobbers, agents, school teachers, bookkeepers, clerks, photographers, milliners, brokers, engineers, druggists, chauffeurs, hotel men, barbers, printers, machinists—in fact, workers and householders in all walks of life. One banker bought a block of stock as a birthday gift to his wife. The high character of the investment, the attractive price and the easy terms appealed to all classes of citizens. That is what made the offering an immediate success.

San Francisco (Cal.) Call, August 17, 1914.

GAS FINANCING PLAN OPERATIVE

The plan of financing the Pacific Gas and Electric Company, through the offering to stockholders, employees and consumers of \$12,500,000 new first preferred stock on very favorable terms, was declared fully operative at a meeting of the directors held yesterday morning. After the meeting Vice-President A. F. Hockenbeamer announced that subscriptions had been received for more than seventy per cent of the new stock, or more than \$8,750,000. Additional sub-

scriptions are streaming into the company's office hourly.

Considered from any viewpoint, the successful flotation of this new stock issue in this manner and at this time is pregnant with suggestion. It was achieved by a full and honest exposition of the company's circumstances, coupled with an appeal to those special classes in the community who might be supposed to know the most about the company's business and its future prospects—its stockholders, its employees and its customers—those who buy its products, gas, electricity water, power and heat. The experiment in its incipency was watched by every large public service corporation in this country. Now that it has proved successful, even beyond the fondest hopes of its originators, who can doubt that many other companies will seek to travel what is now a well-blazed trail? The Pacific Gas and Electric Company, since it announced its offer, has received more than 3,000 individual subscriptions and the number of its stockholders, has almost doubled since January 1st. There is not a corporate undertaking in the wide world that would not be justly proud of such an achievement.

San Francisco (Cal.) Examiner, August 16, 1914.

MEANS MUCH TO BONDHOLDERS.

The success of the refinancing plan of the Pacific Gas and Electric Co. means much to the bond and stock holders of the company. The large additional equity behind the general mortgage bonds means, without doubt, an advance in their price, as the fact of the new financing being done by the sale of preferred stock is quite a bull card for those bonds. From the proceeds of the new stock will be paid off the \$7,000,000 one-year notes maturing March 25, 1915, and certain other obligations, aggregating about \$1,000,000, or \$8,000,000 in all of floating debt. By the sale of the remaining first preferred stock, working capital will be provided, and it is expected that after all notes and floating debt have been provided for, that almost \$3,000,000 working capital will be available.

In addition, the company will have in its treasury, for further investment, \$5,000,000 general and refunding bonds which are available for sale at any time at a price to be fixed by the Railroad Commission. These bonds will be released by the payment of the one-year notes. The \$5,000,000 debenture bonds

also deposited behind the notes will be canceled.

Sinking fund charges will be cared for under an order of the Railroad Commission by the issue of common stock, at par, to reimburse the treasury of the company for expenditures made for sinking fund. The commission has authorized the issue of common stock for this purpose for the current year. The directors recently announced that, beginning with the first quarter of 1915, dividends will be resumed on the \$32,000,000 of common stock, at the rate of 1 per cent quarterly, which will be increased as earnings increase. The company has plans for making a much broader market for the common stock and the new first preferred stock.

Holders of the \$6,000,000 old preferred stock, which will be junior to the new first preferred until July 1, 1916, may, after that date, exchange it for the first preferred stock on the basis of 10 shares of the old preferred for 10¼ shares of first preferred.

San Francisco Commercial News, Sept. 1, 1914.

FAVORABLE COMMENTS BY THE STATE RAILROAD COMMISSION.

The Railroad Commission of the State of California, in a written opinion authorizing the issuance of new preferred stock which is the basis of the plan, made the following favorable comment:

Applicant's plan to sell its new first preferred stock appeals to us as thoroughly sound and commendable. It will enable applicant to refund the outstanding gold note issues of \$7,000,000, put additional security behind applicant's bonds, help take care of the margin between the 10 per cent of construction expenditures and the 90 per cent face value of bonds which applicant can issue against construction expenditures, and probably result in an increase in the price to be secured for its general and refunding bonds hereafter issued. The plan is in accord with suggestions for junior financing which have been made by this Commission from time to time to various public utilities and is worthy of emulation, in so far as applicable, by other utilities.

With respect to that feature of the plan providing for an exchange of the present preferred stock for the new preferred stock, on the basis of 10 shares of the old stock for 10¼ shares of the new, the commission expressed itself as follows:

While this exchange will result in some additional securities over those now outstanding, it is an integral part of a general plan which will materially improve applicant's financial condition and which is worthy of commendation from the public authorities.

PACIFIC GAS AND ELECTRIC COMPANY

DIRECTORS

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JOHN A. BRITTON
W. H. CROCKER
F. G. DRUM

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F. T. ELSEY
D. H. FOOTE
J. E. GLADSTONE
W. G. HENSHAW

A. F. HOCKENBEAMER
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JOHN D. MCKEE
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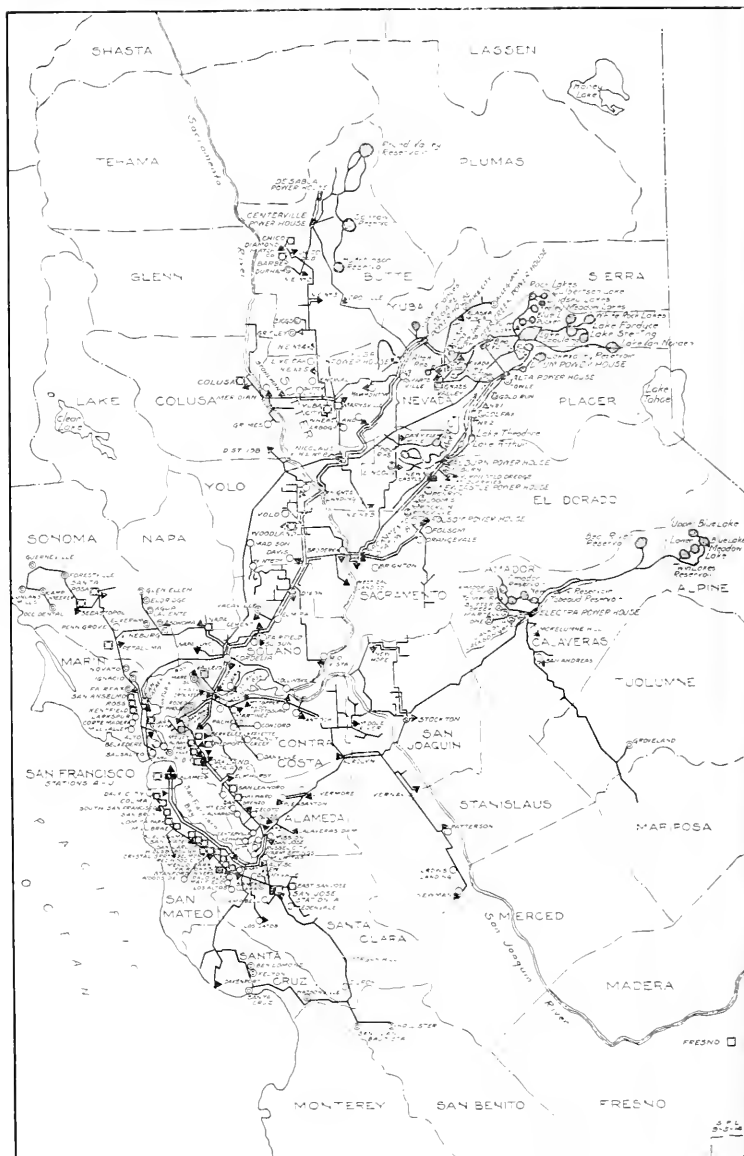
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JOHN A. BRITTON	Vice-President and General Manager
A. F. HOCKENBEAMER	Second Vice-President and Treasurer
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F. H. VARNEY	Engineer O. & M. Steam-Elec. Department
H. C. VENSANO	Civil and Hydraulic Engineer
W. G. VINCENT, JR.	Valuation Engineer
S. V. WALTON	Manager Commercial Department

DISTRICT MANAGERS

<i>District</i>	<i>Headquarters</i>	<i>Manager</i>
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CHICO	Chico	H. B. HERFORD
COLGATE	Colgate	MILES WERRY
COLUSA	Colusa	L. H. HARTSOCK
CONTRA COSTA	Martinez	DON C. RAY
DE SABLE	De Sable	I. B. ADAMS
DRUM	Colfax	JAMES MARTIN
ELECTRA	Electra	W. E. ESKEW
FRESNO	Fresno	M. L. NEELY
MARYSVILLE	Marysville	J. E. POINGESTIE
MARIN	San Rafael	W. H. FOSTER
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NEVADA	Nevada City	JOHN WERRY
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REDWOOD	Redwood City	E. W. FLORENCE
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SOLANO	Dixon	C. E. SEDGWICK
STANISLAUS	Newman	W. A. WIDENMANN
STOCKTON WATER	Stockton	J. W. HALL
VALLEJO	Vallejo	A. J. STEPHENS
YOLO	Woodland	W. E. OSBORN



PACIFIC GAS AND ELECTRIC COMPANY

CITIES AND TOWNS SUPPLIED WITH GAS,
ELECTRICITY, WATER AND RAILWAY

SERVICE FURNISHED	NUMBER OF CITIES AND TOWNS SERVED BY COMPANY			TOTAL POPULATION
	DIRECTLY	INDIRECTLY	TOTAL	
Electricity.....	125	49	174	1,217,438
Gas.....	47	2	49	1,124,568
Water (Domestic).....	9	11	20	58,716
Railway.....	1	..	1	75,602

Place	Population	Place	Population	Place	Population
¹ Alameda.....	27,000	^{1,2} Grass Valley.....	4,500	¹ Pike City.....	200
¹ Albany.....	800	¹ Gridley.....	1,800	¹ Pineole.....	1,500
¹ Amador City.....	200	¹ Grimes.....	250	¹ Pittsburg.....	2,372
¹ Alleghany.....	200	¹ Groveland.....	125	¹ Pleasanton.....	2,000
¹ Alviso.....	200	¹ Guerneville.....	500	¹ Port Costa.....	600
¹ Angel Island.....	280	¹ Hammononton.....	500	¹ Redwood City.....	3,200
¹ Atherton.....	1,250	¹ Hayward.....	4,000	¹ Richmond.....	10,000
¹ Auburn.....	2,375	¹ Hillsborough.....	1,000	¹ Rio Vista.....	884
¹ Agua Caliente.....	100	¹ Hollister.....	3,000	¹ Rocklin.....	1,000
¹ Alvarado.....	900	¹ Ignacio.....	100	¹ Roseville.....	2,600
¹ Antioch.....	3,900	¹ Jone.....	900	¹ Rodeo.....	500
¹ Arboga.....	100	¹ Irvington.....	1,000	¹ Ross.....	500
¹ Barber.....	500	¹ Jackson Gate.....	100	¹ Russell City.....	250
¹ Belmont.....	350	¹ Jackson.....	2,035	¹ Sacramento.....	75,602
¹ Beaumont.....	800	¹ Kearfield.....	800	¹ San Andreas.....	200
¹ Belvedere.....	1,000	¹ Knights Landing.....	350	¹ San Anselmo.....	1,500
¹ Benicia.....	3,360	¹ Knightsen.....	125	¹ San Bruno.....	1,500
¹ Berkeley.....	53,000	¹ Lafayette.....	100	¹ San Carlos.....	100
¹ Brighton.....	100	¹ Live Oak.....	100	¹ San Francisco.....	530,000
¹ Broderick.....	200	¹ Livermore.....	2,250	¹ San Jose.....	37,946
¹ Burlingame.....	4,300	¹ Los Gatos.....	3,000	¹ San Leandro.....	4,000
¹ Camp Meeker.....	200	¹ Larkspur.....	600	¹ San Lorenzo.....	100
¹ Campbell.....	600	¹ Lincoln.....	1,400	¹ San Mateo.....	6,500
¹ Centerville.....	20	¹ Lomita Park.....	100	¹ San Quentin.....	2,500
¹ Chico.....	13,000	¹ Los Altos.....	500	¹ San Rafael.....	6,000
¹ Collinsville.....	150	¹ Loomis.....	400	¹ San Pablo.....	1,000
¹ Colma.....	3,500	¹ Madison.....	250	¹ Santa Clara.....	6,000
¹ Colusa.....	1,500	¹ Madrone.....	125	¹ Santa Cruz.....	16,000
¹ Concord.....	1,500	¹ Martinez.....	5,000	¹ Santa Rosa.....	10,500
¹ Cement.....	1,500	¹ Martell.....	150	¹ Sebastopol.....	1,200
¹ Coffax.....	500	¹ Marysville.....	7,000	¹ Sausalito.....	2,500
¹ Cordelia.....	150	¹ Mayfield.....	1,500	¹ Sheridan.....	150
¹ Corte Madera.....	350	¹ Menlo Park.....	1,500	¹ Smartsville.....	500
¹ Crockett.....	2,500	¹ Meridian.....	300	¹ South San Francisco.....	2,500
¹ Crow's Landing.....	375	¹ Millbrae.....	300	¹ Stanford University.....	2,600
¹ Daly City.....	250	¹ Millpitas.....	500	¹ Sonoma.....	1,200
¹ Danville.....	250	¹ Mill Valley.....	2,500	¹ Stege.....	1,000
¹ Davis.....	750	¹ Mission San Jose.....	500	¹ Stockton.....	35,000
¹ Decoto.....	350	¹ Mokelumne Hill.....	150	¹ Suisun.....	1,200
¹ Dixon.....	1,000	¹ Morgan Hill.....	500	¹ Sutter City.....	150
¹ Davenport.....	1,000	¹ Mountain View.....	2,500	¹ Sutter Creek.....	1,500
¹ Durham.....	500	¹ Mt Eden.....	200	¹ Sunnyvale.....	1,500
¹ Dutch Flat.....	500	¹ Mare Island.....	500	¹ Tiburon.....	400
¹ Duncan's Mills.....	150	¹ Napa.....	7,500	¹ Towle.....	100
¹ Edenvale.....	500	¹ Nevada City.....	2,700	¹ Vacaville.....	1,200
¹ Eldridge.....	500	¹ Newark.....	700	¹ Vallejo.....	13,600
¹ Elmira.....	150	¹ Newcastle.....	750	¹ Vineburg.....	200
¹ El Verano.....	400	¹ Newman.....	1,000	¹ Walnut Creek.....	350
¹ Emeryville.....	5,000	¹ Niles.....	800	¹ Warm Springs.....	200
¹ Encinal.....	100	¹ Novato.....	250	¹ Watsonville.....	4,500
¹ Fairfax.....	500	¹ Oakland.....	215,000	¹ Wheatland.....	1,400
¹ Fairfield.....	834	¹ Occidental.....	400	¹ Winters.....	1,200
¹ Forestville.....	100	¹ Orange Vale.....	100	¹ Woodland.....	3,200
¹ Felton.....	300	¹ Palo Alto.....	6,300	¹ Woodsdale.....	200
¹ Fresno.....	40,000	¹ Pacheco.....	200	¹ Yale.....	400
¹ Golconda.....	1,300	¹ Penryn.....	250	¹ Yuba City.....	1,200
¹ Gilroy.....	2,000	¹ Patterson.....	300		
¹ Glen Ellen.....	500	¹ Penn Grove.....	300		
¹ Gold Rnn.....	100	¹ Petaluma.....	5,500		
		¹ Piedmont.....	1,720		

Unmarked—Electricity only.

¹—Gas only.²—Gas and Electricity.³—Gas, Electricity and Water.⁴—Gas, Electricity and Street Railways.⁵—Electricity and Water.⁶—Electricity supplied through other companies.⁷—Gas supplied through other companies.⁸—Water supplied through other companies.

EMPLOYS approximately 5,000 people.

OPERATES 10 hydro-electric plants in the mountains.

4 steam-driven electric plants in big cities.

17 gas works.

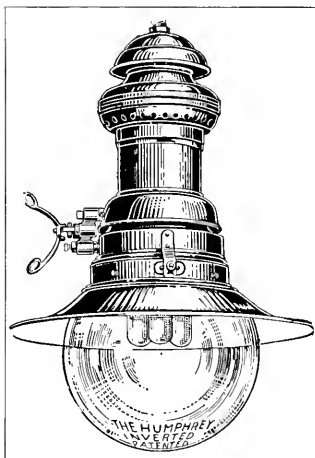
SERVES $\frac{1}{2}$ of California's population.

30 of California's 58 counties.

An area of 37,775 square miles.

¹ the size of New York State² the size of all the New England States combined

The Panama-Pacific International Exposition Company



have decided on the exclusive use of Humphrey Gas Arc Lamps for the street lighting of THE ZONE.

There will be one hundred and forty No. 50 Humphrey Outdoor Arc Lamps in this installation—two lamps to the post—each post equipment giving a

maximum of *eighteen hundred candle power*.

THE ZONE is thirty-five hundred feet in length, extending from the Service Building to Van Ness Avenue, and the complete installation of lamps will give *one hundred and twenty-six thousand candle power*.

*When the Best Is Sought
A Humphrey Is Bought*

General Gas Light Company

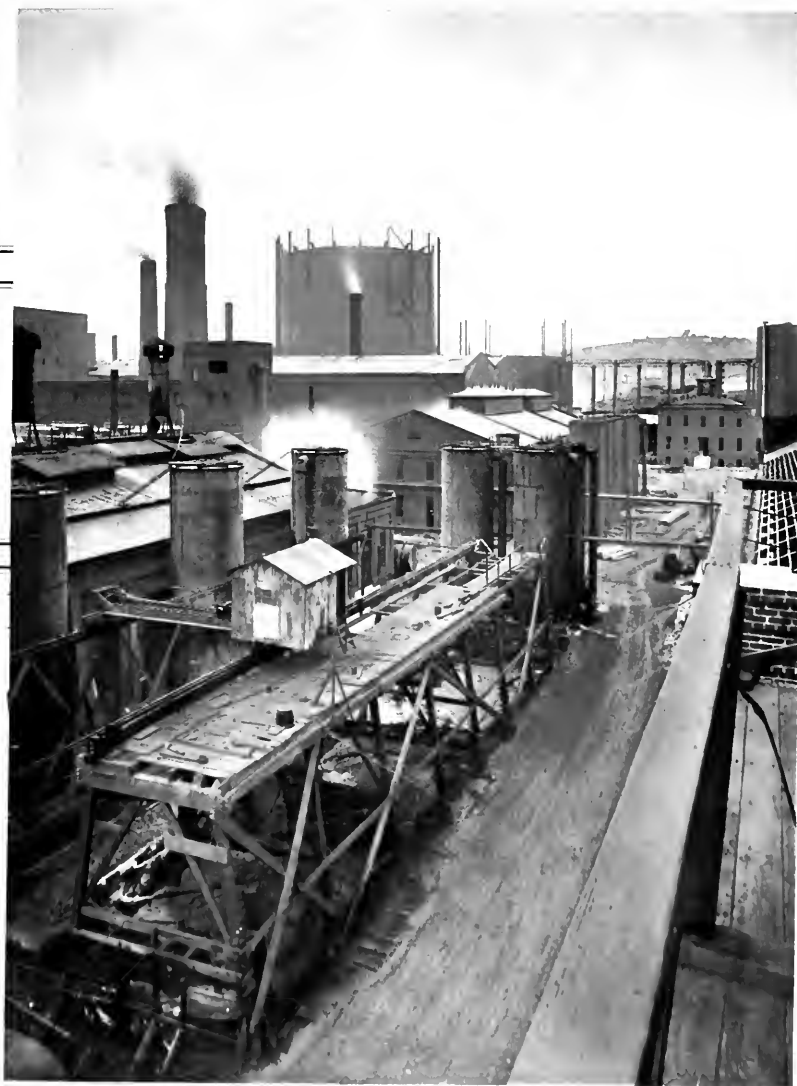
SAN FRANCISCO

G. B. BABCOCK, MANAGER

KALAMAZOO
WELLINGTON, N. Z.

NEW YORK
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PACIFIC SERVICE MAGAZINE

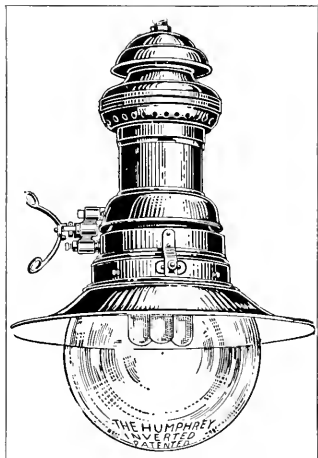


OCTOBER • • 1914

Published Monthly by the Pacific Gas and Electric Co., San Francisco, Cal.

No.
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WELLINGTON, N. Z.

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When writing, please mention PACIFIC SERVICE MAGAZINE



PACIFIC SERVICE MAGAZINE



PACIFIC SERVICE MAGAZINE PUBLISHED MONTHLY BY THE PACIFIC GAS AND ELECTRIC CO., SAN FRANCISCO, CALIF.

Vol.
6

OCTOBER • • 1914

No.
5

Published Monthly by the Pacific Gas and Electric Co., San Francisco, Cal.

For Simplicity of
Control and
Reliability of
Operation, choose

Wagner Quality



Single-phase

Motors

The Motors with the
Trouble Left Out

Ask for Bulletin 10118 Giving Full Details

Wagner Electric
Manufacturing Company, St. Louis, Mo.

San Francisco, Rialto Building
Los Angeles, Pacific Electric Building

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Construction

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London Correspondents:
J. G. White & Company, Ltd.
9 Cloak Lane, London, E. C.

Pacific Service Magazine

VOL. VI



No. 5

Yearly Subscription \$1.50

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Contents for October

MARCONI COMPANY'S WIRELESS STATION AT MARSHALL, CALIFORNIA	<i>Frontispiece</i>
WHERE THE TRANS-PACIFIC MARCONIGRAM FINDS ITS POINTS OF ARRIVAL AND DEPARTURE; MARCONI STATIONS AT MARSHALL AND BOLINAS, CALIFORNIA	143
CONNECTING MARCONI WITH "PACIFIC SERVICE"	<i>Ralph Elsmann</i> 147
THE TWENTY-SECOND ANNUAL CONVENTION OF THE PACIFIC COAST GAS ASSOCIATION	<i>E. C. Jones</i> . . 149
NOTES BY A LOOKER-ON AT THE CONVENTION	<i>F. S. M.</i> . . . 153
"MISSING LINK BETWEEN CAPITAL AND LABOR." ADDRESS BEFORE THE COMMONWEALTH CLUB, SAN FRANCISCO, BY	<i>John A. Brillton</i> 154
IN MEMORIAM—JOSEPH JOSHUA PERRY	157
"SAFETY FIRST." OUR COMPANY ORGANIZES CAMPAIGN	158
PROPOSED UNIVERSAL EIGHT-HOUR LAW UNCONSTITUTIONAL. OPINION OF THE ATTORNEY-GENERAL OF CALIFORNIA	160
PURCHASING DEPARTMENT GETS BUSY	162
DOINGS OF "PACIFIC SERVICE" SECTION, N. E. L. A.	<i>E. B. Price</i> . . 163
"PACIFIC SERVICE" AT THE TENNIS NET	164
ITEMS FROM WOMEN OF THE COMPANY	166
EDITORIAL	168
TIDINGS FROM TERRITORIAL DISTRICTS	171
DIRECTORY OF COMPANY'S OFFICIALS	i
MAP OF COMPANY'S SYSTEM	ii
CITIES AND TOWNS SUPPLIED BY "PACIFIC SERVICE"	iii

Index to Advertisers

Allis Chalmers Mfg. Co	ix	Pierson, Roeding & Co	viii
Associated Oil Co	x	Remington Typewriter Co	vii
Byron Jackson Iron Works	ix	Roehling's, John A., Sons Co	xii
Chaplin-Fulton Mfg. Co	ix	Schaw-Butcher Co	x
General Electric Co.	vi	Sprague Meter Co	x
General Gas Light Co	ix	Standard Underground Cable Co	ix
Halsey, N. W., & Co	10th page cover	Steiger & Kerr Stove & Foundry Co	viii
Huron, Richard & McCone	x	Vagner Electric	2d page cover
Jahns-Mansville, H. W., Co	vii	Westinghouse Electric & Mfg. Co	3d page cover
Mark-Lilly Co	vii	Welsbach Company	vi
Pacific Telephone & Telegraph Co	2d page cover	White, J. G., Engineering Corporation	2d page cover
Patrick & Co	x	Wood, R. D., & Co	vii
Pelton Water Wheel Co	x		



The Marconi Company's wireless telegraph station at Marshall, on the shores of Tomales Bay, Marin County, California.

Where the Trans-Pacific Marconigram Finds Its Points of Arrival and Departure; Marconi Stations at Marshall and Bolinas, California

The establishment of receiving and transmitting stations for its trans-Pacific system is the most recent achievement of the Marconi Wireless Telegraph Company of America. Suitable location has been found for these on the Marin County, California, shores of the Pacific Ocean. The accompanying description of these stations and their equipment is furnished by the company's engineers. It may be mentioned here that "Pacific Service" supplies the electric energy for the operation of the power-house at the Bolinas station.

—Editor PACIFIC SERVICE MAGAZINE.

THE Pacific Coast plants of the Marconi Trans-Pacific chain of high-powered wireless telegraph stations are located within forty miles of San Francisco, one near Marshall on the shores of Tomales Bay, the other near Bolinas on a high bluff overlooking the Pacific Ocean.

The purpose of the system is to afford an uninterrupted radio service across the Pacific, regardless of daily or seasonal climatic changes, giving two distinct lines for the conveying of intelligence by simultaneous transmission and reception.

The distinguishing features of these stations which are of particular interest are their freedom from the different day and night distance ranges of ordinary stations and their traffic capacity resulting from the duplex design. This latter characteristic explains the existence of two plants in California. The Marshall installation is the operating one, where operators side by side transmit and receive. The receiving aerial system is located there, but in order to escape the direct influence of forced waves from the transmitting apparatus while receiving, the latter is located some twenty miles distant at Bolinas, it being actuated by the Marshall operator over a land line built by the Marconi Company connecting the two plants.

Energy is supplied by an 11,000-volt

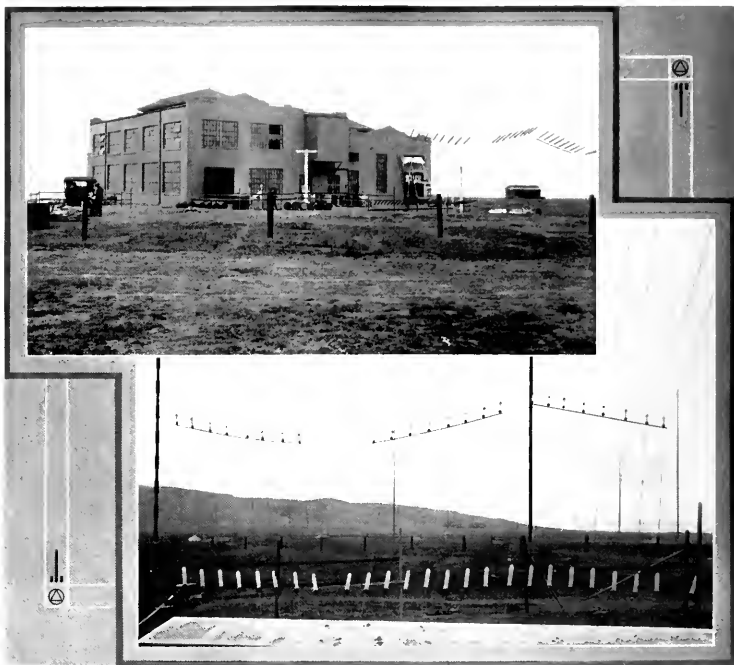
3-phase transmission line connecting with the Pacific Gas and Electric Company's sub-station at Alto, Marin County. This is stepped down to the proper voltage through four transformers. Two of these transformers are normally held in reserve. They supply power for the frequency changers, auxiliaries, exciter sets, air compressor motors, blower motors, fan motors, and the motors driving AC generator sets furnishing power for the operation of the signaling circuits, all of induction motor drive.

The current supplied by the frequency changers is again stepped up through five transformers of special design, one being held in reserve.

All of the above units are in pairs, allowing one complete frequency changer and set of auxiliaries to remain in reserve. All units are each interchangeable. The switching arrangements allow any transformer to be cut out on both high and low sides, the step-down transformers being connected to the 11,000-volt feeder line through remote control oil-switches placed in vaults underneath the switchboard gallery.

The high voltage circuit charges a large condenser which, in turn, discharges twice per cycle through 21-inch wide copper strip buses across the spark gap, located in a sound-proof vault.

The compressors supply air for cooling



Marconi Company's power-house and aerials at Bolinas.

and regulating the discharge, ventilation being supplied with fans. The condenser discharges in series with an inductance, constituting the primary of an oscillation transformer, the secondary of which is connected directly to the aerial-earth system through two regulating coils.

Eight 300-foot tubular steel masts support a 32-wire rectangular antenna about 2000 feet long and 600 feet wide. Directly below this is an elaborate ground system of 32 wires besides an earth plate buried in the ocean below the low-water level.

Signalling is done manually or automatically, at either Marshall or Bolinas, and the arrangement makes it possible to operate the transmitter at very high speed. A small benchboard contains the

instruments and switches controlling the automatic circuits. Lightning protection is afforded by four disconnecting and grounding switches located in the incoming aerial line.

Lighting and small power for the entire plant is stepped down to 110 volts through two 25 KVA 3-phase transformers. A machine shop is located in the main generator room. Two rooms on the second floor provide space for an office and operating room. Here the operator has in front of him the necessary switches for the changing over from transmitting to receiving, lamps being provided to indicate to him the position of the controlling apparatus.

The power-house thus resolves itself into two sections; the first being virtu-

ally a sub-station containing switching apparatus, step-down transformers and generating equipment proper, the second comprising the radio equipment proper. All the buildings are of structural steel and re-enforced concrete construction. A hotel and two cottages provide accommodations for the employees of the company at each station.

As these plants communicate primarily with two similar ones situated at Koko Head and Kahuku in the Hawaiian Islands, advantage of the directional effect in radio telegraphy has been taken and both sending and receiving aerials have been laid out along a bearing directed towards the islands.

A local office for the acceptance of messages is maintained in Honolulu, whence there is direct wire connection with the Radio Stations, and with the Mutual Telephone Company's system that maintains communication between the several islands in the Hawaiian group.

The Commercial Cable Company has for many years enjoyed a monopoly of the business of Trans-Pacific communication, and high rates have been maintained. Owing to the vast expenditure in laying a cable such an extremely long distance and its high maintenance cost, it is probable that the high rate is justified. The Marconi Company, through a material reduction in rates, anticipate a great increase in the amount of Trans-Pacific business which will be developed as a result of this reduction, aided also by the increase in business activity on the Pacific, which will follow the opening of the Panama Canal. The Wireless Service will introduce the Week-End Letter, Cable Letter, a Deferred Service and a Press Service across the Pacific at very reasonable rates.

There is absolutely no question as to the reliability and efficiency of the Wireless Service. Sufficient tests have already been made which prove conclusively that



Interior of Marconi Company's power-house at Bolinas.



The Marconi Company's hotel at Marshall, California.

daylight communication can be maintained across the Pacific, and that signals between the most distant stations in the "circuit" will be very loud and distinct.

Each station has three department heads. The operating manager has direct supervision over the handling of traffic, and is held personally responsible for the efficiency of the operating staff.

The engineer-in-charge is held responsible for all electrical and engineering equipment, and must see that the apparatus is at all times in condition for efficient operation.

The hotel manager in charge of the living quarters is an experienced hotel man. He is held responsible for the proper management of the staff's living quarters. These consist of re-enforced concrete buildings at each station. The ones at the receiving stations contain thirty-five rooms, part of them with connecting baths.

Each hotel has a reading and writing room, billiard and card rooms, and a large reception room. The hotels at the transmitting stations have equal accommodations, except that there are but eighteen sleeping rooms.

In addition to these hotels, there are four cottages at each set of stations. These cottages are finished throughout in oak, are modern in every

detail, and are completely furnished by the company.

This Trans-Pacific system was opened on September 24th, when messages were exchanged between Bolinas and Kahuku stations. Opening ceremonies were held simultaneously at both places. The Californian ceremonies were attended by about thirty prominent citizens of San Francisco, headed by Mayor Rolph and President Michaels of the Chamber of Commerce. The party was conveyed by train and automobile to Bolinas, where luncheon was served at the company's hotel. There were speeches, Mayor Rolph acting as spokesman for the visitors and Mr. A. H. Ginman, general superintendent of the Pacific Coast Division, representing the company.

Meanwhile, similar ceremonies were taking place in Honolulu, where the Governor of the islands and the Mayor of Honolulu headed a party of two hundred guests. There, at a given signal, a silver key was pressed and instantly communication between the two stations was established. The Governor of the islands filed the first message, addressed to the President of the United States. It was instantaneously received at Bolinas and transmitted to Washington over the Western Union wires.



The Marconi Company's power-house at Bolinas, California.

Connecting Marconi with "Pacific Service"

By RALPH ELSMAN, Electrical Distribution Department

IN ORDER to supply service to the Marconi Company it was necessary to build a line from our Alto sub-station to Bolinas Point. This was constructed by the Pacific Gas and Electric Company and is approximately twenty miles long.

In order to reach this point it was necessary to build over the rough country surrounding Mt. Tamalpais. Long spans were necessary in order to cross the numerous canyons, the longest span being 1440 feet, crossing Rocky Canyon. The line is designed for 11,000 volts, 3-phase, and is operating at this voltage at the present time.

In general 35-foot poles spaced 300 feet apart are used. For the long spans "A" frames were constructed in order to allow proper clearance between wires,

and in order to hold the severe strain. Triangular construction was used on all poles, the top pin being 1 $\frac{1}{4}$ -inch gas-pipe with leaded thread. The two lower wires are placed on a 7-foot cross-arm, the pins for same being 5x14-inch bolt with leaded thread. The spacing of the wires forms an equilateral triangle practically throughout the entire line.

The line insulators are Locke 408 A, and on all corners and long spans the Ohio Brass 10566 Strain Insulator is used. No. 4 hard drawn copper wire was used throughout except for the long spans. Here we have used the new copper composition wire. The size of this wire is No. 2 and consists of seven strands of No. 11 composition. Same has a conductivity of 40% and a break-



Substation at Alto, Marin County, California, whence "Pacific Service" transmits electric energy to the Marconi Company's station at Bolinas.



Pacific Gas and Electric Company's transmission line from Alto to Bolinas showing long span crossing the Bourne ranch.

ing strength of 3380 pounds. The resistance is 3.14 ohms per M foot at 68° Fahrenheit. The temperature co-efficient is .0000165 per 1° C. rise. The weight is 176.8 pounds per M foot, and the modulus of elasticity is 18,000 pounds per square inch of strand. Owing to the toughness of this wire it is ideal for work of this character. K. P. F. sectionalizing switches are installed at five different points along the line in order to test in event of trouble, etc.

Considerable trouble was first experienced with the O. B. strain insulators, some having broken down in service. However, these have been replaced with insulators of the same type and are now operating entirely satisfactorily.

This line has also done much toward helping the development of the country surrounding Bolinas and Willow Camp. At Willow Camp a tap is taken from this line and the voltage is stepped down from 11,000 to 220 volts, supplying this community with "Pacific Service." At the end of the Bolinas Lagoon an outdoor sub-station has been erected, the transformers stepping down the voltage from 11,000 to 2300 volts. The town of

Bolinas is supplied with service at 2300 volts for all purposes.

A 3-phase 2300-volt line extends from this point to the town of Bolinas. This town, although only twenty-six miles from San Francisco on an air line, has enjoyed but one modern convenience in all the years of its existence, that being the telephone. No railroad connects with the town, all transportation being done either by stage or boat. All freight, etc., is sent by boat from San Francisco, the trip taking three hours in good weather. About three trips a week are made.

A modern distribution system supplies the town and now the large summer colony as well as the all-year-round inhabitants enjoy the convenience of "Pacific Service" instead of the old coal-oil lamps which were used for many years.

So this picturesque resort by the seashore under the shadow of Mount Tamalpais bids fair to grow in importance. It is handicapped, at present, by its comparative isolation, for the means of public transportation is by automobile stage from San Rafael or by water from San Francisco. But this will be remedied some day.

The Twenty-Second Annual Convention of the Pacific Coast Gas Association

Held this year at Long Beach, Los Angeles County, California

By E. C. JONES



Hotel Virginia, Long Beach, California, where the Pacific Coast Gas Association held its convention this year.

FOLLOWING the example of the older gas associations, it was decided that the Pacific Coast Gas Association should hold its twenty-second annual meeting outside of the atmosphere of gas works and the detracting noises of a great city, and get together in one happy and contented family party in the beautiful Hotel Virginia, located within sound of the breakers at Long Beach, California.

It has been the invariable rule with these annual gatherings of the association that the last has always been declared the best meeting ever held. This was particularly true of the Southern California meeting, which opened Tuesday morning, September 15th, with Mr. Champ S. Vance of Los Angeles, president of the association, in the chair. The elements which combined to make this the most successful meeting ever held in-

cluded a large attendance of members, accompanied by their wives and daughters, a long list of vitally interesting papers which brought out animated discussions, an exhibit of gas appliances which has never been equaled for excellence in the history of the association, and the tactful mingling of business and pleasure in the midst of semi-tropical setting and weather which only Southern California can provide. Much of the credit for the success of this meeting is due to the untiring efforts of President Vance, who arranged the meeting so that there was not a wasted moment. The good things came so fast that the four days allotted to the meeting were all too short.

The report of the secretary and treasurer showed the association to be in good financial condition, and the report of the board of directors gave evidence of the

complete harmony which exists in this little gas association way out on the shores of the Pacific. The association library was shown to be in flourishing condition and evidenced the fact that a technical library catering to the needs of the gas man can be successfully maintained by a gas association. The president's address was a concise and able paper reviewing the growth of the gas business through the past year, and contained suggestions which were adopted by the association.

One of the most interesting features of the meeting was what might be called a composite paper, prepared by the gas appliance men of the association, consisting of five separate papers lettered from a to e, each dealing with a separate department of the gas appliance business and describing the growing use and success of gas in his department. The papers were as follows:

- a—Gas Street Lighting.
C. B. Babcock.
- b—Gas Lighting in the Home.
R. J. Thompson.
- c—Domestic Use of Gas.
B. S. Pedersen.
- d—Industrial Uses for Gas.
H. P. Pitts.
- e—Water Heating for Gas.
H. R. Basford.

Some time ago the association realized that if the manufacture of gas is conducted with the greatest degree of economy, and the distribution is so well and amply maintained that the service to the consumer is almost perfect, the most essential part of the gas business still remains to be done; and the sale of gas has at last taken its rightful place in the regular work of a gas association. The gas engineer may make good gas and sell it cheaply, but the appliance men must provide means and show us how to dispose of it. These papers were most ably discussed by nearly all the members present, and it was proven that a group

of papers dealing with the subject of the sale of gas can hold the attention of a body of gas men throughout the entire time allotted to a meeting. It might be said that the five papers on the general utilization of gas were forcefully illustrated by the attractive exhibit of appliances, which was provided and arranged by the gas exhibit committee, consisting of the writers of these five papers. This exhibit occupied a large room on the ground floor of the Hotel Virginia, and included every conceivable gas appliance most attractively displayed. The exhibition was open to the general public day and night and was well attended. In addition to the educational value of the exhibits, an added contribution to the pleasure of the visitors was an afternoon and evening cabaret performance very creditably done by artists from Los Angeles. These papers contained so many valuable suggestions and afforded such a bright promise of the continued supremacy of gas over electricity, that the association voted to award a gold medal to each of the five writers of the papers.

Two other papers completed the commercial side of the convention. These were: "The Appliance End of the Gas Business," by P. C. Wickersham, which was particularly well received and fully discussed, and the paper by R. C. Powell entitled, "Gas Versus Electricity for Cooking," which was so full of good things that it seemed as though it could hardly be improved by discussion. The discussion of this paper, however, confirmed the writer's opinion that electricity, at the present time, is not a competitor to be feared of gas for cooking and heating.

Mr. D. E. Keppelmann, the general superintendent of the Distribution Department of the San Francisco district of the Pacific Gas and Electric Company, read a paper on "Welding in Gas Distribution." This paper dealt with the historical and experimental features of welding up to the time that it was first applied to the joining of steel and wrought-iron gas mains. Following this

was a most comprehensive and complete review of the work done by Mr. Keppelmann and illustrated by pictures showing the progress of the work and the various fittings and welded gas-lines after completion. This splendid paper covers the entire field of welding gas-pipes to the present day and should be a useful textbook in the hands of every gas distribution department. It may be interesting to note that the first work done in this field, and the first paper read on the subject of welding, were by members of the Pacific Coast Gas Association.

Mr. John D. Hackstaff presented a paper on "The Wholesale Distribution and Measurement of Gas," dealing with the handling of natural gas in large quantities, and the successful measurement of it by simple and inexpensive apparatus. It reviewed Mr. Hackstaff's work with the Pilot Tube and Venturi types of meters, and gave valuable information in regard to the construction of Orifice meters as used by his company. This paper led to a spirited discussion which brought out many valuable points.

Owing to the absence of the author, Mr. C. P. Cutten, his paper on "The Nature and Extent of the Obligations of a Gas Company to Improve Its Facilities and Extend Its Service" was read by Mr. John A. Britton. This paper handled the subject in a scholarly way and cited various court decisions and legal authorities to emphasize the writer's findings.

The subject of "Safety First" was ably handled by Mr. C. A. Luckenbach, of Los Angeles, who read a very interesting and valuable paper on a subject which is probably second only in humanitarian value to the work of the Red Cross Society, and the work of these two glorious movements might be compared to a recent argument in which the respective merits of two gas engineers was under discussion, and it was decided that the engineer who keeps out of trouble is to be preferred to the somewhat careless but resourceful engineer who gets out of trouble.

Mr. H. W. Burkhart, editor of the

Wrinkle Department, presented a number of valuable and useful wrinkles, and the character of the work and the manner in which it was presented clearly show that the Wrinkle Department is in the right hands.

Past President John Clements, as editor of the Experience Department, did his work well; and the useful lessons conveyed by the experiences were so nicely tempered with humor that the paper formed a pleasant ending of the literary program.

The report of the committee on gas engineering degree showed progress and that our association members are generously contributing to this good work.

Three members of the association volunteered to give a course of lectures at the University of California during the coming year on subjects relating to the manufacture, distribution and chemistry of gas.

The report of the committee on the International Gas Congress for 1915 evoked the same enthusiasm which has existed in our association since it was first decided that there should be an International Gas Congress held in San Francisco during the period of the Panama-Pacific International Exposition. The affairs of the congress are in able hands in the joint committee on the International Gas Congress, composed of members of the American Gas Institute and all other participating gas associations of the United States, and the local affairs of the congress are in the hands of a most enthusiastic committee of the Pacific Coast Gas Association, made up of willing workers who have never known a failure.

The next meeting of the Pacific Coast Gas Association will be held in San Francisco concurrent with the International Gas Congress, which will be held in the new Auditorium during the week beginning Monday, September 27, 1915, and it is the intention of the Pacific Coast Gas Association to act as host to visiting gas men from all parts of the world and

to in every way contribute to the success of the Congress and to the comfort and happiness of its members. Californians have the reputation of knowing how to do these things, and it is only hoped that there will be a very large number of visitors from the East and abroad to share our hospitality and find out why we love California so much. The following officers were elected to carry on the work of the association for the ensuing year:

President, E. C. Jones, San Francisco; Vice-President, Frank A. Cressey Jr., Modesto; Secretary-Treasurer, Henry Bostwick, San Francisco; Directors: Messrs. John A. Britton, San Francisco; C. O. G. Miller, San Francisco; W. B. Cline, Los Angeles; W. G. Kerckhoff, Los Angeles; H. M. Papst, Portland, Ore.; C. B. Babcock, San Francisco; Robert J. Thompson, San Francisco.

One of the pleasantest features of the meeting was the attendance of Mr. Harry L. Strange, of Honolulu, who is a most beloved member of the association. His zeal and the success he has met with in the conduct of his business in Honolulu make him a welcome addition to a convention of gas men, for he generously shares his knowledge and seems to bring with him a flavor of his beautiful island home, aptly styled the paradise of the Pacific.

This was not entirely a men's convention. The ladies added their part to its success. On Wednesday evening, September 16th, a ball was given in the ballroom of the Hotel Virginia, which was largely attended by the members of the association and their ladies. It was really a brilliant affair, and showed that gas men can rise out of the troubles of their business and enjoy life. Just preceding the dancing, through the kindness of Mr. Strange, the assembly was permitted a glimpse of the beauties of the Hawaiian Islands by a stereopticon talk.

The banquet on Thursday evening was a brilliant affair, attended by all of the members and their guests. The dinner

was excellent and was served in the Hotel Virginia's best style, interspersed with orchestral music and songs by the members under the direction of our inimitable and indispensable friend, Mr. J. F. Parker. Past President John A. Britton presided over the banquet as toastmaster, to the delight of everybody, and with his intimate knowledge of the hearts and heads of the diners he skillfully drew out the best there was in them of wit and eloquence.

The city officials and the representatives of the Long Beach Consolidated Gas Company were good to us. His honor, the Mayor, welcomed the association to Long Beach in a stirring address delivered at the opening of the convention. He was followed by the president of the Long Beach Consolidated Gas Company, who is also president of the Long Beach Board of Trade, in a speech of welcome on the part of the Gas Company and the business men of Long Beach.

One of the pleasures of the banquet was the presence of Mr. F. A. Green, the general manager of the Long Beach Consolidated Gas Company, who has recently had a great sorrow, which has saddened his life, in the loss of the partner of his home. This sad event was followed by a serious illness, and it was only his strong will-power, aided by his loyalty to the Pacific Coast Gas Association, that permitted him to be with us for a short time during the banquet. During the convention Mr. Green's name was added to the International Gas Congress committee of our association.

On Friday the members and their ladies enjoyed a sea trip to Catalina Island, leaving on a special train in the morning for San Pedro, where they embarked on the steamer Hermosa for Avalon. There a delicious luncheon was served; afterward trips were made in glass-bottom boats to see the submarine wonders of Catalina, and visits were made to the aquarium and other points of interest. The party returned to Long Beach in the evening.

Every one voted the twenty-second annual meeting to be the most profitable and pleasurable convention the association has ever held. The combination of work and play made work a pleasure. Before this delightful meeting passes down into memory we should record our appreciation of the generous hospitality

of President Vance, the Los Angeles Gas and Electric Corporation, the Southern California Gas Company and the Long Beach Consolidated Gas Company, and a word of praise must be given to the press of Los Angeles and Long Beach for their interest in the convention and their faithful record of its events.



Notes by a Looker-on at the Convention

It is customary, no doubt, as Mr. Jones observes, to vote each convention the best ever. Custom or no custom, this year's convention held unusual interest for the gas men of the Pacific Coast.

The five papers on "The General Utilization of Gas" called forth a discussion of an exceptionally earnest character. Harry Strange, of Honolulu, certainly "started something" when he suggested that the Pacific Coast companies enter the appliance field and establish a central laboratory for the purpose of testing and designing appliances. He was challenged, of course, and Mr. Britton, among others, came to the rescue of the appliance men.

"I take my hat off to them," he said. "Thirty-five years ago gas could not be made and sold in competition with other well-known fuels. Look at conditions today! Not so very long ago gas averaged from 100 to 500 B. T. U.'s per cubic foot. Today it reaches nearly 700."

The election of Mr. E. C. Jones to the presidency of the association means, of course, that our famous gas engineer will play a most prominent part in the entertainment of the gas men who will visit San Francisco during the period of the Exposition. In addition to presiding over next year's convention, which will be held in the Exposition city in June, Mr. Jones will have a great deal to do with the International Gas Congress, arrangements for which are already in

full swing. Mr. Jones is a member of the joint committee for arrangements for the big congress, and also a member of the committee of management of the International Engineers' Congress, also to be held in the Exposition city, and chairman of its committee on local affairs.

The name of Jones is one to conjure with wherever the gas industry is mentioned. Our E. C. has been in the gas business all his life, and joined the American Gas Light Association as far back as 1879. When that institution was merged with the Western and Ohio Gas Light Association into the American Gas Institute, Mr. Jones entered the combine as a charter member and read a paper at its first meeting.

He is an enthusiast upon the subject of gas, and being a man of tireless energy readily wins his way. In the Pacific Coast Gas Association he is regarded as a veritable orator. He was its third president, elected to office in 1895, and now, after a lapse of nineteen years, he becomes once more its administrative head.

The course of gas engineering established last year at the University of California proved a fruitful topic of discussion. Mr. E. C. Jones offered to contribute a series of lectures on "The Chemical Analysis of Gas," and Mr. D. E. Kepplemann offered a course on "Gas Distribution." Both offers were cordially accepted, of course. E. S. M.

“Missing Link Between Capital and Labor”

Address by Mr. John A. Britton before the Commonwealth Club, San Francisco, September 2, 1914.

At the September meeting of the Commonwealth Club in San Francisco, Vice-President and General Manager John A. Britton spoke upon the subject of the “Missing Link Between Capital and Labor.”

Mr. Britton was one of four contributions to a symposium upon the subject mentioned, the Commonwealth Club inviting the debate for the purpose of hearing argument upon all sides of the question. Frank P. Walsh, president of the United States Industrial Relations Commission, was selected to present the case for the public; Dr. David P. Barrows, of the University of California, spoke from the standpoint of the student, and Paul Scharrenberg, the well-known labor leader, represented the wage-earner in presenting his views. Mr. Britton spoke for the employer, and his masterly review of the situation as it stands between capital and labor made a deep impression. He spoke as follows:

BY WAY of introduction, Mr. Chairman, I want to make a motion, if it is in order, and it is this: I move to amend the question now before the house by striking out the words “capital and labor” and inserting in place thereof “employer and employee.” For, as the terms “capital” and “labor” are now employed, they mean an impassable gulf, not to be spanned by any human endeavor. Or, to paraphrase, capital is

“ * * * a creature of such hideous mien
That to be hated needs but to be seen;
Yet seen too oft, familiar with its face,
We first endure, then pity, then embrace.”

The laborer, as the term is commonly used, refers to that downtrodden, out-of-the-heels-and-elbows fellow that has no capital and no standing in the community that he serves.

For fear that on this complex subject I might misquote myself or forget some of the thoughts that have come to me, I am going to ask your indulgence to permit me to read a few of the things that I have thought of in connection with this missing link.

The links that bound employer and employee together in the years gone by were links forged in the spirit of friendship and confidence, which attributes were engendered largely by the same attitude of one to the other. Before science introduced appliances in trade, industrials and commerce, to meet the growing demands of the increasing population of the world, most, if not all, of the work performed in providing the necessities of life in manufactured products was accomplished by the hands of the workmen rather than by the modern method of machinery, and before the era of large centers of population, which called for the development of the science of telephonic communication, supply of electric energy, the manifold and increased uses of artificial gas, and the transportation by means of urban and interurban electric systems, to meet the demands, it was possible to bring into close contact employer and employee. The employer had definite and positive relations with his employees; he was as familiar to them as they were to him; family ties and relations were known to the employer, and the interest of the employer and employed was one strong and tie-binding mutuality.

The employee in such days was happy, contented, and in many cases men of property and means.

FAULT OF LEADERS.

As increased demands by the growth of what might be called forced luxuries were made for workmen, increased burdens and duties were laid upon them until, as a matter of self-protection, they were compelled to organize, and the organization and federation of labor were generally, in the initiative of such matters, fruitful of good results to the employees, but, as in all organizations, whether political, fraternal or social, there immediately arose leaders of men, who, because in a great degree of the strength gained by the attraction of the organizations which they represented, became as most leaders do, demagogues—and then arose the popular cry of the oppressions of capital and the depressions of labor, by those who knew neither capital nor labor, and capital and labor, as now defined and as exploited by the press and by crafty politicians, became synonyms for master and servant, or master and slave. These appellations in our American commonwealth were by the immortal Lincoln stricken from the lexicon of the American people, and should not now be used in the depreciated sense in which both are usually employed.

Capital and labor are both honorable. Capital is that which is sought after by labor for the relief of its conditions, and should not be held up to the scorn of the American public as it is being done, any more than labor should be brought down to the level of a cringing creature subservient to the will and wishes of an alleged dominant capital.

ORGANIZATIONS MUST EXIST.

The two great organizations of the world—employer and employee—must always exist, and the missing link can only be found and restored to the chain that must bind men together in one humanitarian cause, by the re-establishment of confidence as between the two classes. As there must always be a government to regulate and control the people and to pass laws for their protection, so must there be fundamentally in the upbuilding of any nation or part of a nation, an organization composed of the two classes of employer and employee, each having due respect for the rights of the others, and neither class possessing any right which it must not concede as a privilege to the other.

The principles of our American government are founded upon protection, and that protection can only be assured by the equal administration of the laws. Inequality in the administration of laws must provoke strife, and strife produces a great economic waste, whether such strife be between classes of individuals or between states or nations.

No man dare assert that the working-man of today has not been vastly benefited by the organization which he has been able to effect, and this is particularly true in this State of California. The insistent demands of labor that it be rewarded for its efforts in the upbuilding of commonwealths, based upon the fact that it is an integral part of the success of men and nations and that it is entitled to share reasonably in the profits of the same, cannot and will not be denied by any fair-minded man. That it has any God-given privilege, however, to obtain these rights and the privilege of putting itself outside of the pale of the law, or committing, condoning or assisting tacitly in acts of violence and acts of depredation against persons and property to obtain them, cannot be admitted by any fair-minded man.

Unfortunately, the employer and employee have both been to blame in their failure to find the fusible metals of right-thinking conscience and judgment, fel-

lowship and confidence, that will weld this missing link into the completed chain, and it may require the strong hand of a fraternal government to accomplish this much-to-be-desired result.

TO BE CONSIDERED WITHOUT PREJUDICE.

All nations are beginning to realize that the problem of the proper care of men who are the upbuilders of commonwealths in the actual sense, and upon whom we depend for that stamina of metal characteristics so necessary in the building up of nations, must be considered from a fair and impartial standpoint and not from any prejudiced point of view. It would seem that in the absence of that clarity of common sense and fairness which has been exhibited in the past, and in the absence of the usual give-and-take principle which obtains among right-thinking men, that some court of arbitration must take up the work of welding these missing links together. Ever since the beginning of time men have by arbitration adjusted difficulties otherwise impossible of solution, and in this modern rushing day so must the employer and employee have recourse to this only one sensible way of the settlement of this much-vexed question; for, if employer and employee stand upon the firm foundation fixed in their minds—that they are without wrong in any premise which they assume, then we must look for a continuance of the unfortunate situations that have arisen and are arising between these two classes upon which so much depends for the future prosperity of our State and our Nation.

CANADA'S SOLUTION CITED.

It would seem as if the Dominion of Canada has reasonably solved, by its recent enactments of an arbitration law, these vexed questions. Some such scheme which will bring for general discussion before a liberal tribunal the differences existing, offers apparently the proper means to that end.

If labor stands upon its fundamental principles that it has the right to strike, then labor must concede—if it is going to be fair, and let us assume that it will be fair—that the employer must stand upon the fundamental principle that he has the right to employ whomsoever he chooses, in the event that by a strike he is deprived of the right to conduct his business according to his own desires, and that this right will not be by labor disputed with force; for it is inconceivable that there should be a condition existing in this boasted country of liberty, where the rights of individuals can be so trampled upon that they will be deprived of the prerogatives granted to them by the Constitution of their forefathers.

It has been well said by one of the thinkers of today, in an article recently submitted to the Academy of Political and Social Science, in discussing the outlook for industrial peace:

The strike and lockout are crude, barbaric and wasteful; they prove nothing of value and settle nothing permanently; they show only which side is the stronger or has the greater power of resistance—not which side is right. After the conflict angry passions rankle in the breast of the defeated, and the fire is but temporarily smothered. On the other hand, the settlement of differences in an enlightened manner proposed by liberal investigation and publicity through a fair tribunal, brings out the facts and establishes justice. This is the only true and final settlement of any differences between men.

In this view I fully concur.

ADDRESS MADE IN STOCKTON.

In a discussion of the principles involved in the conduct between employer and employee, I had occasion to say in an address delivered in the city of Stockton, in the month of May of this year, the following words in answer to a request

from an association made up of employees as to what should be the relation between employer and employee:

I bear no brief to you in defense of either the employer or the employee, but on a broad general principle it is not only proper and right, but humane and logical, that there can be no participation of effort as between the two correlated bodies unless the rights of both are strictly observed. No one can deny that, as a general rule, the working-men of the past have suffered from inequalities and from discriminations, which were not justified excepting by reason of that animal instinct which all human beings possess to a large degree of attempting to control those over whom they have authority and power.

I am neither in favor of the open-shop or the closed-shop as these expressions are commonly used. I am strongly in favor of reasonable agreements between men, but I am not in favor of the petty politicians on either side of the fence that seek to create and foment trouble as between them both. Labor has a place—organized or disorganized—in the material make-up of the nation's progress and development, and must be so recognized—but it must take its place alongside and not in front of the capital that creates, ennobles and assists it; it must not defer, endanger or impede the progress of the nation; it must not dictate unreasonable terms, and it must not, in the attempted enforcement of these terms, resort to the days of savage brutes to gain its end. It must resolve to be dominated by logic, reason, fairness, and equity, and not by force and threat.

The rank and file of the army of the employed are as good citizens as you or I; they are filled with the same ambitions, desires and hopes; they are law-abiding and patriotic. These virtues we must grant to them. They can and do differentiate as closely as we between the elements of right and wrong in the disparities that arise.

ARBITRAMENT NECESSARY.

And so summarized, if the employees will continually be led by the passionate utterances and desire for power existing in the minds of their leaders, and will not be amenable to a reasonable interpretation of the rights of individuals, and will not consent to the arbitrament of difference along sane lines—then there is little or no hope for our finding the missing link existing between the two classes. If, on the other hand, both classes will meet the issue in the spirit of true patriotism and in the spirit of true friendship and confidence—then will the missing link soon be found and forged into an everlasting chain of progress and equity, and achieve that so much desired by that lowly Nazarene, "Peace on earth and good will towards men."

In Memoriam

JOSEPH JOSHUA PERRY

Born October 31, 1847

Died August 19, 1914

In the death of Joseph Joshua Perry, which occurred on August 19, 1914, at Oakland, Cal., another vacancy was made in the rapidly thinning ranks of the old employees of the original Oakland Gas, Light and Heat Co., now the Oakland District of the Pacific Gas and Electric Company.

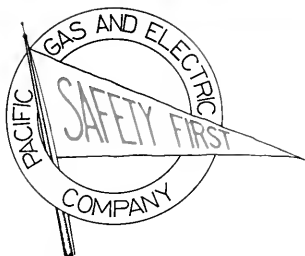
He was born in Bryley Hill, Staffordshire, England, October 31, 1847, where he learned his trade. He came to America in 1872 and finally to California in 1880. His first work in California was for the Pacific Iron & Nail Co. in Oakland, as bricklayer and yard foreman, and he did repair work at odd times for the Gas Company until about 1884, when he came to work for the company as a steady employee.

His genial disposition made him a favorite among all of the employees of the Gas Company, and although on the retired list, one of his enjoyments was to come down to the works and meet his old friends.

He was a member of Oakland Lodge, No. 188, F. & A. M.; Lodge of Perfection, Scottish Rite; Live Oak Lodge, Knights of Pythias, and Oakland Bricklayers Union, No. 8.

The funeral was held from Masonic Temple, Twelfth and Washington streets, Oakland, under the auspices of the Masonic Lodge.

He is survived by a widow and five children, two of whom are working for the Gas Company.



Our Company Organizes a Comprehensive Campaign

"PACIFIC SERVICE" has now been carrying on a "Safety First" campaign for nearly a year. It has installed innumerable safety devices and has eliminated such sources of danger as have been made known to the management. It intends to continue to install safety devices and remove sources of danger, no matter what the cost, but it realizes that these are but steps in the direction of effective safety work.

For the purpose of insuring the co-operation of the company's workmen, perhaps the most important step in the direction indicated, safety committees have been organized in every district, with a Central Safety Committee to whom it will be their business to report. On September 5th Vice-President and General Manager John A. Britton announced the appointment of the following as the Central Safety Committee:

E. C. Jones, Chief Engineer Gas Department.
 P. M. Downing, Engineer O. & M. Hydro-Electric Department.
 F. H. Varney, Engineer O. & M. Steam-Electric Department.
 S. J. Lisberger, Engineer Electric Distribution.
 John P. Coghlan, Manager Claims Department.

The duties and powers of this committee are: To have general charge and supervision over safety work; to have general supervision over district safety committees; to establish standards for safeguards; to promulgate safety rules; to pass on all controverted safety matters; to award prizes to individuals and departments for the best suggestions and records for safety; to select and designate premium stations. The committee also has authority to call for reports from managers and superintendents at any time and to command the assistance of all managers and superintendents in the work to be done. Mr. E. C. Jones is chairman and Mr. Coghlan secretary of this committee.

Supplementing this Central Safety Committee sub-committees have been established in each of the following districts: Chico, Colgate, Colusa, Contra Costa, De Sabla, Drum, Electra, Fresno, Marysville, Marin, Napa, Nevada, Petaluma, Placer, Redwood, San Joaquin, Santa Rosa, Sotano, Stanislaus, Stockton, Vallejo, and Yolo. In the districts of San Francisco, Alameda County, Sacramento and San Jose sub-committees have been constituted, to be known as electric distribution, gas distribution, electric substation and gas station safety committees. In the San Francisco and Alameda County districts there are also steam

station safety committees, and in the district of Sacramento a street railway safety committee.

Each sub-committee is made up of three members. The first committee consists of the district manager or the department superintendent, a foreman and one workman, and he is appointed by the district manager. The district manager or department superintendent serves for one month, the foreman for two months and the workman for three months. As each retires his place will be filled by the remaining members of the committee and the new member serves three months. By this system one member is retired each month, while all members have three months' service. While it is desired, if possible, that one member of this committee shall always be elected from among the district or department foremen, whenever it is deemed necessary or advisable all three members may be elected from the ranks of the workmen. No two members of a committee are taken from the same line of work, and all employees, including office and warehouse men, are eligible for service. It is desired that each committee shall at all times be representative of as many different lines of employment as possible.

Each district or department committee is required to make safety inspections in its district or department; to recommend safeguards, rules of safety and safe working methods; to investigate accidents, and to render written reports on forms provided for the purpose. Each committee must make at least one inspection a month of its district or department. Whenever necessary the Central Safety Committee or the district manager may order more frequent inspections and allow time in which to carry them out.

Each committee is to investigate and report upon all accidents called to its attention by the district manager or department superintendent or by the Central Safety Committee. All accidents disabling workmen over ten days are to be called to the attention of the committee by the district manager or department superintendent for its investigation and report. The report of the committee is to cover fully the cause of the accident and the best method of preventing similar accidents in the future.

Each committee is to make a detailed report at least once a month. Its report must show what investigations and recommendations were made during the month and what safety suggestions were made to the committee or originated with the committee or any of its members. All reports are to be made in duplicate, the original to go to the district manager or department superintendent and the duplicate to the Central Safety Committee.

Each committee has power to report to the proper foreman or superintendent any careless workman or any careless or dangerous method of work coming to the notice of any of its members. Reports so made and the action taken thereon shall be reported in the monthly report to the district manager and to the Central Safety Committee.

As a badge of distinction each member of the Safety Committee is to wear a safety button furnished by the company, showing his membership on the committee and indicating the character of his work. On retiring from the committee he passes this button on to his successor.

The work of the Central Safety Committee will be at all times under the direction and subject to the jurisdiction of the Vice-President and General Manager, to whom all general orders are to be submitted for approval.

The State's Legal Adviser Holds the Proposed Universal Eight-Hour Law Unconstitutional

"Though the people may initiate legislation and thereby voice their economic theories of government, it must be remembered that such legislation, whether it be in the form of an act or an amendment to the State Constitution, must accord with the provisions of the United States Constitution.

"Section 1, Article XIV, of that constitution provides that no state shall deprive any person of life, liberty or property without due process of law, nor deny to any person within its jurisdiction the equal protection of the laws.

"It would appear, therefore, that the proposed law, even if adopted by the electors at the November election, would be unconstitutional."

—Opinion of Attorney-General Webb on the proposed eight-hour law.

THE Attorney-General of the State of California, in an exhaustive opinion transmitted to Governor Johnson, declares that in his judgment the proposed universal eight-hour law, even if it should be adopted by the electors at the polls next month, would be unconstitutional and, therefore, invalid.

The determined opposition to this measure which is in evidence everywhere caused the Governor of California to call upon his official legal adviser for an opinion as to its constitutionality. In obedience to this call Attorney-General U. S. Webb investigated the question thoroughly, and his opinion recently handed down is a document covering thirty-seven type-written pages of about nine thousand words. In this Mr. Webb cites numerous cases wherein similar laws have been declared unconstitutional, not only by various state courts but by the highest tribunal of the land, the United States Supreme Court. Following are some excerpts from the Attorney-General's opinion:

"It should be borne in mind that the question itself is one which involves to a large degree economic policies of government. Such policies have changed materially in recent years and acts which formerly were regarded as freely open to the citizens of the country are now universally regarded as proper subjects of restrictions and even prohibition on the part of the sovereign power. That sovereign power lies now, as it has always lain in this country, with the people, though it is only recently that the people have taken to themselves more directly the power of the initiative in legislation which formerly they left to a body of their citizens chosen by themselves.

"But though the people may initiate legislation and thereby voice their economic theories of government, it must be remembered that such legislation, whether it be in the form of an act or an amendment to the state constitution, must accord with the provisions of the United States Constitution.

"Section 1 of Article XIV of that constitution provides that no state shall deprive any person of life, liberty or property without due process of law, nor deny to any person within its jurisdiction the equal protection of the laws.

"While this provision remains all laws of a state, whether adopted by the Legislature or the people, must conform thereto and be interpreted in the light in which the highest court of the land has construed that section, finding therein a protection to the people from what the court has considered to be an unlawful infringement by the state upon individual rights.

"The purposes of, the fourteenth amendment, adopted immediately after the Civil War, and in view of the circumstances which occasioned that war, was to protect the individual in his personal liberty as against oppression by the state or other individuals of the state, whether they formed a majority of that state or not. But this personal liberty, which was thereby assured to the individual, was not a personal liberty such as to enable him to act to the detriment of the state. And it is not to be supposed that the states or the people of the United States in adopting this amendment surrendered in any manner their right to preserve by legislation their own existence. Therefore any legislation which in the minds of reasonable men has a tendency to promote the public welfare is permissible, notwithstanding the fact that in its operation it may affect in some degree the personal liberty of the individual. . . .

"The Supreme Court of the United States and the Supreme Court of this State up to the present time have been unwilling to sanction legislation which has for its object the limiting of the hours of labor of individuals, unless that limitation is restricted to some class or occupation wherein the limitation has some bearing, in the eyes of the court, upon the health or general welfare of the public, and that heretofore those courts have not found that such limitation has such bearing when addressed generally to all individuals irrespective of sex or occupation.

"It would appear, therefore, that under the decisions cited the proposed law, even if adopted by the electors at the November election, would be unconstitutional."

Among the various points made by the proponents of this measure is one that a similar law applicable to women has been upheld. The Attorney-General in reply to this declares that the basis for the decision upholding the eight-hour law for women was the fact that it was for the benefit of the state; that the limitation of working hours for woman sustained her in her physical condition and rendered her more able to carry the duties of motherhood.

MUST KEEP ON FIGHTING, HOWEVER.

It would appear that the Attorney-General's opinion is conclusive of the matter under discussion. At the same time, it would not be well for the opponents of the proposed law to make this an excuse for letting up on their activities. Though the proponents of the measure appear to be in the great minority, they are working zealously night and day to attain their point, and so it behooves all good citizens to join in the movement to effect a settlement of the question once and for all. Public opinion carries more weight than any legal opinion; moreover, should its opponents fail to go to the polls on November 3rd this most disastrous measure might be carried, in which event it would be necessary to carry it into the courts, a matter involving not only expense but delay, during which much business and all industrial enterprise would be plunged into chaos.

The best way to avoid trouble, good citizens of California, is to go to the polls on election day and vote "NO" against this proposed universal eight-hour law.

Leading newspapers of California are opposing the measure with all their force. So are hundreds of working men and women. An interesting point in the discussion is found in the result of a recent investigation by the California State Labor Bureau. Taking as a basis the hours of one hundred and fifty-four male wage-earners, the Bureau found that thirty-six per cent were working eight hours daily, forty-three per cent nine hours and sixteen per cent ten hours; and that all were paid overtime. Now, it must be thoroughly understood that this proposed universal eight-hour law would not only limit a man's hours of labor to eight in any one day, but, also, to forty-eight hours in any one week. It

would absolutely prevent him from turning to profit the result of his labor above a certain period. It would close to him one source of income, namely, that of pay for over-time when, because of his familiarity with the work in hand, because of his proficiency, because of his actual worth, his services are so much in demand that his employer is willing to give him this extra compensation.

It has been calculated that the adoption of this proposed law would result in materially reducing the average wage-earner's income, and with the cost of living constantly increasing it is difficult to see how he would come out under such conditions.

As stated before in these columns, the farmer is fighting this measure for all he is worth. He is organized in nearly every county in the State of California; for the adoption of a universal eight-hour law would seriously hamper him at certain periods of the year when it is an absolute necessity that his farmhands shall work longer hours than at others. It has been contended that the reduction of the hours of labor for the farmhand from ten to eight hours would result in the diminution of the farm product by one-fifth. California is now credited with an annual agricultural production of \$372,500,000. Reduce this amount by one-fifth and you get \$298,000,000, a loss to the farming industry and to the State of California of \$74,500,000. Furthermore, this diminished output would cost about as much to produce as the larger amount, for the same wages and food would be demanded by the farmhand under an eight-hour arrangement as is claimed under the ten-hour schedule.

There is not an industry in the State, not a class of society, that would not be seriously affected by the adoption of any such measure as this. Once again, therefore, we call upon the qualified electors of California to go in a body to the polls on November 3rd and vote it down.



Purchasing Department Gets Busy

The following contracts have been placed by the Purchasing Department:

Contract with the Schaw-Batcher Company Pipe Works for two Jones Gas Generator Sets with Scrubbers for the Potrero Gas Works, San Francisco, and for one Jones Generator Set with Scrubbers for Station B, Oakland.

Contract with the American Car Company, St. Louis, through Pierson, Roeding & Company's Pacific Coast agency, for six new street cars of the "P. A. Y. E." type.

Contract with Ralston Iron Works for steel anchor houses, Carquinez Straits.

Contract with R. D. Wood and Company, Philadelphia, Pa., for 500,000 cu. ft. gas holder for Redwood City.

Contract with Duncanson-Harrelson Company for foundation for gas holder.

Contract for scrubber trays for Gas Station B, Oakland, with Bay Point Manufacturing Company.

Contract for pump house at Potrero Gas Works, San Francisco, with J. R. Cahill.

Contract with Western Iron Works for checker plate flooring and steel uprighting for generator building at Potrero Gas Works, San Francisco.

Contract has been entered into with the Sprague Meter Company covering our requirements of gas meters for two years from September 1, 1914.

Contract for centrifugal fan and booster for Potrero Gas Works with B. F. Sturtevant Company.

Contract with Harron, Rickard and McCone for high pressure gas exhauster for Potrero Gas Works.

DOINGS

of "PACIFIC
SERVICE" SECTION

N.E.L.A.

CHRONICLED BY ERNEST B. PRICE

The August meeting of "Pacific Service" section of the National Electric Light Association was held on Friday evening, August 14th, at Native Sons' Hall, San Francisco, Mr. S. V. Walton presiding. The feature of the evening was an illustrated lecture by Mr. Murray of the Great Northern Railway on the Glacier National Park, Montana. It proved most interesting, and at its conclusion a vote of thanks was tendered Mr. Murray.

The second meeting of the sub-section series was held on Friday evening, August 28th, under the direction of the O. & M. Department, steam-electric section, Mr. F. H. Varney presiding. The following papers were read and discussed: "Crude Petroleum," by Mr. F. W. Small; "Steam Power Plant Efficiencies," by Mr. E. A. Rogers; "Steam Distribution," by Mr. H. P. Pitts. The papers elicited many interesting and profitable discussions.

The regular monthly meeting of the Company Section was held on Friday evening, September 11th. Chairman S. V. Walton presided. After the reports of the various committees had been heard, the chairman introduced as the speaker of the evening Mr. Louis Levy, of the Publicity Department of the Panama-Pacific Exposition. Mr. Levy delivered a most interesting and instructive talk, illustrated by stereopticon slides and moving pictures, describing the main features of the Panama Canal, following which he showed some beautiful colored pictures of the Exposition grounds and buildings. He also showed motion pictures of notable events which have taken place on the Exposition grounds from time to time. At the conclusion of the

lecture, a vote of thanks was tendered Mr. Levy.

The Electric Distribution Section meeting was held on Friday evening, October 2nd. In the absence of Mr. Walton Mr. F. H. Varney, vice-chairman of the Company Section, opened the meeting and then turned it over to Mr. S. J. Lisberger, engineer of electrical distribution. The subject of distribution was sub-divided into three main topics and was illustrated by lantern slides. Mr. C. J. Wilson discussed "Methods of Distribution," Mr. F. C. Piatt took up the subject of "Costs of Electric Service" and Mr. A. U. Brandt spoke on "Voltage Regulation." The papers presented were of great interest not only to the members of the distribution department but also to representatives of other departments of the company, and it is to be hoped that the great interest awakened in the affairs of "Pacific Service" section of the N. E. L. A. by these sub-section and monthly meetings will be further stimulated by good work on the part of those selected to prepare and read papers at the future meetings of the Company Section.

There was a large attendance on Friday evening, October 9th, when Dr. Ng Poon Chew, the famous Chinese journalist and statesman, delivered an address on the "Birth of a Nation." The distinguished Oriental has been called the "Chinese Mark Twain," and from the points of both humor and lecturing ability he certainly proved the aptness of the title.

Remember that the next sub-section meeting will be held October 23d under the direction of the Auditing Department Section, M. H. Bridges chairman.

"Pacific Service" at the Tennis Net

THE fourth annual "Pacific Service" tennis tournament has come and gone. It proved to be the most successful so far held, and we sincerely hope that next year will witness a yet greater turn-out of contestants for the trophy.

The tournament proper was held on two private courts in Oakland on August 23d, the final and semi-final matches being played the following Saturday in Golden Gate Park, San Francisco. In commenting on the performances of the many participants it is very hard to give each and every player the praise due him. Many "dark-horses" appeared, as is usually the case in affairs of the kind. Players such as E. B. Henley and M. H. Bridges, who displayed great form in



M. H. Bridges displays great activity.



I. C. Steele, this year's winner, in characteristic attitude.

covering the court, were vanquished only after long hard-fought sets by E. M. Szczepanski and Gene Dougherty, respectively. The real, fine net work of K. I. Dazey and H. A. Laidlaw puts them in a class by themselves.

The match between E. E. Dodge and R. E. Fisher was a thriller, Dodge finally winning out, 6-8, 7-5, 6-1. W. G. Vincent vanquished K. I. Dazey in a three-set match in which the steadiness of Mr. Dazey was a feature. Score, 3-6, 6-3, 6-0. In the third round there were very close and exciting matches. H. C. Vensano was beaten by E. E. Dodge after he had all but won the match. The final score was 5-7, 7-5, 6-4.

Another match worth commenting on was that between V. H. Jones of the Sacramento Supply

District and I. C. Steele of the Construction Department. Steele finally won the match, 6-8, 7-5, 6-4.

E. M. Szczepanski won from W. G. Vincent, 3-6, 6-4, 6-3. The match was distinguished for an unusual number of deuce games.

Steele beat Szczepanski in straight sets, the latter not playing up to the form displayed against Vincent.

In the semi-final round Dodge beat R. A. Monroe after a grueling match, 6-3, 3-6, 6-4. Dodge's fast and well-placed drives were very difficult for Monroe to return, while Monroe's smashes were quite impossible to handle.

Immediately after this match Dodge played the finals with Steele and was beaten, 7-5, 8-6, in a hard-fought match. Dodge's place shots and accurate lobs kept Steele running over the court like a wild man. The first set appeared to be all Dodge's, when he lead at 5-3, but the pace was evidently too fast after the match with Monroe and he finally lost the set.

The cup was donated by A. G. Spaulding & Co. and must be won three times by the same player before becoming his permanent trophy. Previous winners are: 1911, E. E. Dodge; 1912, R. E. Parr; 1913, E. E. Dodge.

This tournament has created such a wide interest among the employees of the company that they intend to form a "Pacific Service" Tennis Club and, if possible, construct a court on the property at Station "K," now under construction at Twenty-fourth Avenue and Balboa Street. A "Round Robin" doubles tournament is being arranged.

All those interested in entering this doubles play should notify Mr. H. C. Vensano.



E. B. Henley, "Watchful waiting."
K. I. Dazey, "A Dazey high-bull."
W. G. Vincent, "In repose."
V. H. Jones, "Some service."

Items From Women of the Company

This section of PACIFIC SERVICE MAGAZINE is open to any of our women employees who may desire to contribute notes on persons and events. The following have accepted appointment as contributing editors: Miss Letitia A. Curtis, Engineering Department, Hydro-Electric Section; Miss Bertha J. Dale, Auditing Department, San Francisco District.—Editor PACIFIC SERVICE MAGAZINE.



View of the Taku Glacier, near Juneau, Alaska.

A trip to Alaska is a trip worth while. It will never be looked upon with regret. In fact, the experience is so wonderful that one who has enjoyed it and afterward looks upon views of the many beautiful places visited is inclined to wonder if the experience has actually been gone through—if it is not, after all, a creature of the imagination. At least I know that feeling has come to me more than once.

The very journey up there is picturesque. Your experience begins immediately upon leaving San Francisco, if you travel by water, for, on approaching the Golden Gate, the beautiful Exposition grounds loom up before you and you get a panoramic view of the elegant buildings with their elaborate trimmings, which are almost completed. Then you travel up the coast, an experience you may or may not enjoy, and eventually you reach your first stop, Victoria.

Of course, everybody is anxious to pay a visit to the pretty little English town. Most do so, and it is amusing to listen to the many and various stories that are told upon returning. Your next stop is Seattle, and there you have a chance to recuperate for a couple of days until you take the steamer for Alaska. Your boat leaves Seattle at night, and when you awake in the morning and view your surroundings you are fairly taken back at the beauty of the scene. This part of your journey really seems like a dream, for it lies all among wooded islands, while the water all around looks like glass in its lake-like smoothness and changing colors of blue and green.

As the vessel approaches the Seymour Narrows with their swift currents and many sudden turns, the captain goes upon the bridge and ascertains conditions. If the water is smooth enough the boat goes through, if not it is anchored outside for

two or three hours, during which time the men get out their fishing rods and enjoy good sport. It seems the fish are not good eating, however, so, after they are caught they are usually thrown back into the water.

After passing the Narrows the scenery becomes still more beautiful, for the ship creeps in under snow-capped mountains. Occasionally a white fog comes down, entirely without warning and so thick that although we are close to the land we can see nothing of it, and the ship is brought to a standstill. The fog, however, retires just as quickly, and so we go on and on, in and out, and then on again through the Wrangle Narrows.

You travel for about four days before setting foot on terra firma. The first stopping place is Prince Rupert, a rapidly growing town soon to be a terminus of the Canadian Pacific. The ship also stops at Juneau, the capital of Alaska; Sitka, the old capital when Alaska belonged to Russia; Wrangell, Douglas Island and Skagway. All the towns are alike, wooden streets and wooden sidewalks, Indians and a genuine Esquimaux now and then with their little trinkets to sell.

The passengers visit the Treadwell Mines and are taken through by a guide at a rapid pace. At Skagway a train takes one over the White Pass, through a wild, rough country, following the old trail to Dawson. What hardships the men must have endured in the mad rush for gold! And there is a little graveyard here telling a pitiful story of those who fell by the wayside. At the summit the Stars and Stripes and the British flag wave peacefully side by side. Then on to Lake Bennett, where a good square meal is served. One gets pretty well chilled through, but it is so invigorating one just loves it.

The sunsets are most beautiful, every color in the rainbow, and the glow on the snowy mountains is simply magnificent. But the most wonderful spectacle of all is witnessed on the homeward trip

—the Taku Glacier. The ship approaches to within a very short distance of it, and the whistle is blown in order that the vibration may cause pieces of the glacier to break off. The vibrations are grand; three times they echo. The glacier, a deep blue shading to white, is simply beautiful, and when the sun shines it is still more beautiful.

One encounters a good deal of rain on the trip to Alaska, but it dries up quickly. Every minute is enjoyed. Try it. If one gets too much of the water by the time one returns to Seattle, one may return to San Francisco by railroad, a beautiful trip, passing Mt. Rainier, Mt. Shasta, with a glimpse of our latest wonder, the volcano, Mt. Lassen.

GERTRUDE G. GLAZIER.

On August 1st, the young ladies of the Gas Distribution Department, San Francisco District, gave a surprise luncheon to Miss Dorothy Van Tassell in honor of her engagement to Mr. Edwin Katz of this department. Those who helped to make the "Surprise" a success were: Misses Flora Raaz, Margaret Munro, Ella Jones, Rosalind Giovanoni, May Barrett and Irene Pearce.

A very pretty wedding took place in Nevada City on August 12th when Miss Mary Lou Werry became the bride of William Henry Hosking of Grass Valley.

Miss Werry is the daughter of Mr. John Werry, who is our company's manager of the Nevada District, and she is counted one of Nevada City's most charming native daughters. Mr. Hosking is a prominent citizen of Grass Valley and holds the position of city editor on the Union, the daily newspaper.

Mr. Paul J. Freygang of the Electric Distribution Department, San Francisco District, was recently married to Miss Alice M. Williams, of Los Angeles, at St. Stephen's Episcopal Church, San Francisco.

Pacific Service Magazine

PUBLISHED IN THE INTERESTS OF ALL EMPLOYEES OF
THE PACIFIC GAS AND ELECTRIC COMPANY

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The Pacific Gas and Electric Company desires to serve its patrons in the best possible manner. Any consumer not satisfied with his service will confer a favor upon the management by taking the matter up with the district office.

VOL. VI. OCTOBER, 1914. No. 5

EDITORIAL

During the past few months this company has won three notable victories in the United States District Court, in suits brought, respectively, to enjoin the enforcement of ordinances establishing confiscatory rates for gas and electricity furnished in San Francisco and for gas furnished in the city of Sacramento.

The ordinances complained of purported to establish rates for the fiscal year 1913-1914. All three suits were referred to Hon. H. M. Wright, Standing Master in Chancery, to take evidence and report to the court his findings and conclusions thereon. The first report of the Master, filed July 20, 1914, was in the San Francisco gas case, in which the rate of 75 cents per 1000 cubic feet of gas was found to be confiscatory. The hearing was upon an order to show cause why an injunction *pendente lite* should not issue. The case was fully presented by both the company and the city and all the issues were given careful consideration by the Master.

The Master allowed as an annual reserve for depreciation and obsolescence the sum of \$444,360, being a straight-line allowance of 3.66 per cent of the reproduction value of the depreciable property. Of this amount the sum of \$121,410 was allowed for obsolescence or functional depreciation, as distinguished from

natural depreciation due to the wearing out of units of physical properties. For going concern value the Master allowed but \$500,000. In his report, referring to this allowance, he stated: "It appears probable that on final hearing the complainant may prove a value to this item greater than this, and apparently not less." This is the first rate case in this jurisdiction where the principle has been recognized that a utility is entitled to have its intangible property, represented in its established business, separately valued and added to the value of the physical property.

The Master refused to deduct from the reproduction value of plaintiff's property the cost of paving over mains which had been laid before streets had been paved, holding that the public in a rate-fixing proceeding is taking the use of what the company presently has and must give compensation on the fair present value of that property. To quote: "That property is not mains laid under sand, but mains laid under concrete and asphalt. It includes land as affected by present population and surrounding improvements, not that land as it was many years ago. It includes property for which nothing has been paid."

The Master determined that any ordinance establishing a charge for gas in San Francisco which would afford a net return of less than 6 per cent on the present value of the property devoted to public use would deprive the company of its property without due process of law, and would take its property without just compensation. The reproduction value of the gas properties in San Francisco for the year 1913-1914, including working capital and going concern, the Master found to be \$13,823,417. He deducted 20 per cent from the reproduction value of the physical properties to arrive at the present value of those properties.

The Master's report in the suit over rates for electricity in San Francisco was filed on the second day of September, 1914. This suit involved many compli-

cated questions in the apportionment of joint costs and expenses between commercial and residence consumers and between electricity used for light and power, in addition to the segregation of general expenses between the gas and electric departments. The city set up the claim that as the company was furnishing electricity in the congested districts at rates less than those established by the ordinance, its insufficient revenue was due, partly, to loss sustained in the downtown district, where its rates were lower than those fixed by ordinance, and, partly, to losses occasioned by competition. In connection with this claim of the city, the Master said: "If the plaintiff sustains losses in competitive territory, it would not seem fair that it should make up these losses by undue exactions from non-competitive territory to which the residence schedule applies. At the same time, legislation cannot be defended which allows, for example, a maximum charge to power-users so high that the company could not, even without competition, charge it and do a profitable business, and, simultaneously, so low on residence lighting as to produce a loss."

In its complaint the company showed that it was furnishing electricity under competitive conditions, *i. e.*, competition with other electric companies and competition with other forms of energy, at rates lower than those established by the ordinance, but that these rates in the congested districts where competition existed afforded the company a reasonable net profit. The company's engineer, Mr. W. G. Vincent, made a careful and complete apportionment of the cost of electric service between "Consumer's Costs," "Demand Costs," and "Energy Costs." The results of his study were set forth in an affidavit which showed that the rates established for residence consumers did not provide sufficient revenue to equal the cost of serving them. The Master accepted the conclusions of Mr. Vincent, though contested by the city, and found the residence rates to be unprofitable and

the rates in the congested district to be profitable, though these last-named rates are determined largely by competitive conditions.

The Master found the reproduction value of the electric properties for the year 1913-14, including working capital and going concern, to be \$12,093,641. To arrive at the present value of the depreciable property he deducted 15 per cent from the reproduction value of such property. He accepted the unit costs of the property contained in the company's inventory, but reduced the overhead charges contained therein to 18 per cent, being the same allowance as was made in the gas rate case. The Master complimented the witnesses and attorneys on their work in the following terms: "I may remark in passing that the presentation of this case, both by expert witnesses and by counsel, has been characterized, as was the corresponding presentation in the gas case, by conspicuous ability and very gratifying evidence of fairness."

The Master, in his report on final hearing in the suit of Pacific Gas and Electric Company *v.* City of Sacramento, found that a permanent injunction should issue against the city of Sacramento restraining the enforcement of the ordinance establishing a rate for gas during the year 1913-1914 of 95 cents per 1000 cubic feet. The city of Sacramento made many technical objections during the hearing, basing its defense entirely on matters of law. Its legal objections, though admittedly ingenious and ably presented, were declared by the Master to be without merit. They went not only to the jurisdiction of the court, but also to the applicability of the Fourteenth Amendment to rate-fixing cases. The Master spoke in commendatory terms of the efficiency of the Sacramento gas plant and the economies of its operation. To quote:

"It clearly appears from the evidence that plaintiff's plant at Sacramento is in all respects a normal plant in its relation to the economic demand, being neither too large nor too small, but adequately adapted to the needs of the community.

It also appears from the evidence that plaintiff's plant is well constructed and kept at 100 per cent efficiency; that the affairs of plaintiff company in relation to its business in Sacramento have been prudently and economically conducted. It has had the advantage, as a single unit among many plants in Northern California owned by plaintiff, of the economies that result from consolidation, in manufacture, in administration, and in obtaining necessary funds."

The Master paid a just tribute to Mr. E. C. Jones' qualifications and fairness as a witness. He said:

"The valuation of its plant, other than land, upon which plaintiff relies, is that of its chief gas engineer, Mr. E. C. Jones. Mr. Jones' unusual qualifications and experience as a gas engineer and his revealed character as a man of integrity of mind and careful judgment commended his testimony highly to the Master upon the hearing; and I think it likely that these qualifications will appear to the court from a reading of the transcript. His plan, as he states it in the valuation, was to proceed in a conservative spirit 'as though I were employed as an engineer for the purpose of determining the value of that property for my client to purchase it.' At certain points in his valuation he does not value the identical structure, built upon conditions requiring more expense than upon a present reproduction, which, under the law, he would be entitled to do, but uses modern substitute structures and modern methods of construction as a criterion. I cite this as an item to show the conservatism of his valuation."

In regard to the rate of return which a public utility furnishing gas in Sacramento is entitled to earn, the Master found that any charge for gas that would not allow the company to earn at least 7 per cent on its investment would be confiscatory. His finding on this point was as follows:

"In recent cases I have found, and in this case I find, that it is a principle fair to the legislation under attack to assume that a fair rate of return should at least be as great as the current rate of return for money loaned, in the community in question and at the time in question, on a class of securities where the interest rate is low. I refer to mortgages on city real estate where, under the law, there is a security above the loan of 40 per cent of the value of the land. It is quite possible that the proper rate of return to a public service corporation should be greater than this to reach the ordinary normal profit of a business enterprise of

the same degree of safety and of risk. The normal rate of interest on such mortgages in Sacramento during 1913-14, and, in fact, generally, without reference to that year, was shown by the evidence to be 7 per cent. Without, therefore, deeming it necessary to decide what a legislative body should allow the plaintiff for a reasonable rate of return, the court may, and should, find that any rate of return shown by the evidence to be less than 7 per cent on the value of plaintiff's property is confiscatory."

The work entailed in the preparation and presentation of these cases has been great. The results of these successes are not alone confined to the additional revenue which the company will secure in successfully resisting unfair attempts to cut down its rates, which have always been fair and reasonable and less than the service was worth, but the principles which have been established, after careful and exhaustive presentation by the attorneys on both sides, will be of great benefit as a guide for legislative bodies engaged in fixing rates in the future.

Mr. John P. Coghlan, manager of our Claims Department, has been appointed Receiver of the Northern Electric Company.

The appointment was made by Judge Maurice T. Dooling of the United States Court October 5th, and was hailed by all parties concerned as highly satisfactory in every way. Mr. Coghlan, though still a young man, has had an opportunity to show marked ability in more than one important situation. He was for many years a newspaper reporter in San Francisco and occupied his spare time with reading for the bar. Shortly after his admission he was taken into the City Attorney's office under Percy V. Long and was entrusted with a most important line of work in which he earned distinction. He has been with "Pacific Service" now several years, and, needless to say, he is a most valued member of our organization. That he will give a good account of his stewardship in the very important task to which he has recently been assigned, goes without saying.

Tidings From Territorial Districts

Alameda County District

On Thursday evening, the 13th of August, about thirty of the employees in the Oakland Collection Department assembled at the Hof Brau Cafe at a banquet given in honor of Mr. C. H. Cowell, formerly head of that department, who has recently been appointed to take control of the introduction of carbon fuel.

It was an informal gathering of well wishers and a most entertaining evening to all gathered around the festal board. Mr. Geisenhofer was toastmaster and proposed that Mr. Cowell give a little talk about his new duties and work, which he did in an interesting and lucid manner, explaining that carbon fuels were to be placed on the market and his work would be the introducing and disposing of these products to the dealers. His listeners were greatly edified and much impressed with his enthusiastic whole-souled interest in his subject.

At the conclusion of the banquet the guest of honor was taken leave of with heart-felt expressions of good will by all who had the pleasure to be present, for in the six years which Mr. Cowell has been in charge of the Collection Department he has commanded the highest esteem and loyalty of those under him.

Manager Frank A. Leach, Jr., of the Alameda County District is some hunter.

The boys took him off one evening away from the sight of pole lines, and tried to lose him in the wilds of his own district. The bunch separated in the chaparral. He found himself alone. Did you ever have that feeling of only the sky overhead, and hills and thickets as far as you can see? It's a silence that starts the chills. He recalled boyhood days when he was taken out one night and left with a sack and a short candle, while his companions circled out to drive in the snipe. He wondered whether history was repeating itself. He heard a shot in the distance. Presently in a clearing on the opposite hillside he saw something moving. Buck ague! Did you ever have it? Anyway the rifle got to his shoulder and it's hard to tell which one was more surprised. However, the deer's did not last long; it rolled in a trembling mass. The boys hastened in and congratulations went the rounds. He doesn't yet quite understand whether the deer was stalked out, or it was pure simple hunter's luck. Anyway he was game. It

was no small one, either; weighed one hundred and thirty pounds.

P. S.—It had horns.

The Commissioners of the town of Berkeley have ordered 74 gasoliers to be erected along Grove Street from the city line north, and also 19 along Shattuck Avenue.

The Commissioners made a lengthy study of the street lighting conditions. This decision was reached after visiting the principal cities about the bay.

Mr. O. A. Knopp, superintendent of the Electric Testing Department, Oakland division, has accepted an appointment to serve on the Meter Committee of the National Electric Light Association which will hold its convention in San Francisco in 1915.

There was an excellent attendance at the regular monthly meeting of the "Pacific Service" Club held July 23d at Lorin Hall. Chairman Burdette Cornell presiding.

The special feature of the proceedings was an interesting address by C. B. Babcock, Pacific Coast Manager of the General Gas Light Company, on the advantage of gas for illuminating purposes. He handled his subject well, showing a thorough knowledge of the lighting end of the gas industry. After his address cigars were passed around.

Mr. Brandt of the Electric Department sang, accompanied by Mr. Hunt of the Bookkeeping Department on the piano. Good stories by William Waldeck Beers of the Berkeley office and also dialect stories by Mr. Burrell of Berkeley.

All in attendance voted it one of the best meetings given by the Club.

Albert Sable of the Gas Arc Maintenance Department became the possessor of a fine new Oakland touring car. In purchasing some meat he received a coupon as a chance on this machine and proved the lucky man. He immediately sold the car for \$1000 and presented the money to his mother. His mother is an invalid. It will make her days happier and brighter. This is "Pacific Service."

An extension of electric service about to be made in Alameda County involving an appropriation of \$5115.91 is that of the L. k. v. line from Mt. Eden about two miles to the bay, for approximately 150

h. p. of load at the Oliver Salt Works. This is one of several old established industries along the shore, and will doubtless open a new field for electric power. The motors are to be used for pumping and in the factory for refining.

The present installation replaces approximately 75 h. p. in steam and 50 h. p. in gasoline engines. Additional power will probably be used as fast as conditions justify it.

Sacramento District

The Fifth Annual Convention of the California Association of Electrical Contractors and Dealers, held in Sacramento from August 4th to 8th, inclusive, was voted the most successful of the organization.

This Association is rapidly becoming one of the most influential and progressive branches of the great electrical industry. This was evidenced by the attendance, every branch of the industry—central station, jobbers, manufacturers—being well represented, as well as the contractors and dealers, from all parts of the State.

During the course of the Convention interesting papers and discussions were held, in both open and closed meetings. Mr. George C. Holberton gave a most interesting illustrated lecture on the Pacific Gas and Electric Company's system. Mr. Britton was scheduled for one of his delightful talks, but unavoidable circumstances prevented his attendance.

The Entertainment Committee, with Mr. Tom Scott as chairman, and our Messrs. C. R. Gill and J. O. Tobey, and others did themselves and the city proud in their lavish and hospitable entertainment, in the form of an auto ride—thirty-two machine loads—up and through Folsom prison, and back through Orangevale and Fair Oaks. At each of the latter places each visitor was given a large basket of fruit fresh from the orchards. A moonlight ride and dance up the Sacramento River, the annual dinner and ball at the Hotel Sacramento, and, as a fitting windup, a picnic at Smith's Mound, up the Sacramento River.

There is no doubt that each person attending this convention went home with a better opinion of the city of Sacramento and its people, and the great value of co-operation as a means of advancing the electrical industry as a whole.

The Forum Building at Ninth and K streets is adding four stories, which will make this a ten-story building. This will be the largest building in Sacramento when finished, with a frontage of 100 feet and 160 feet depth. The four upper floors will be occupied by different State

officers. "Pacific Service" serves all of the building with both gas and electricity.

Our genial general shop foreman (Railway Department, Sacramento District), Joe Coppin has a chest of some proportion and a smile of considerable expanse, and nothing seems to deflate the one or remove the other—all brought about by the happy advent of twin boys—and Joe says they are *some* boys.

A lady called at the Sacramento District Office to pay her electric bill and, approaching the counter, was addressed thusly by the young lady behind the desk: "Flat or meter?" to which the consumer demurely replied, "Why, I live in a cottage."

On the evening of August 12th a large company of the office force of the Sacramento District mobilized at the mouth of the American River, and after a hot battle captured "Fort Sandbar," where camp was pitched, and while camp fires blazed all sat down to an enjoyable feast. Music and songs held sway until a late hour, when camp was broken and all marched home, well satisfied with the trip and looking forward to the next big battle, which is to be soon. The following took part in the engagement:

ARMY.—Major General H. Smith, General Mamie Genis, Brig. General Miss Hall, Colonel A. Olson, Lieut.-Colonel Stell Anderson, Major M. Smith, Captain Ethel Battelle, Lieutenant Lucile Chauvet, Sergeant L. Williams, Private C. R. Gill.

NAVY.—Admiral W. Barnett, Captain Gertrude Meyers, Commodore Margaret Brenham, Lieutenant Mrs. Barnett, Midshipman J. Melby, Boatswain Cecil Chauvet, Chief Gunner D. Newington, Able Seaman L. Chapman.

Sacramentans, beware! Beware particularly if your business or your pleasure takes you down J street next week. Beware when crossing the street; beware when trying to catch a car.

These warnings are necessary, for the Pacific Gas and Electric Company will place the six new P. A. Y. E. cars, which arrived here yesterday, on the J street line next week, and a tremendous increase in the speed at which those cars will travel will be the most immediate result. The cars are modern in every particular, with automatic air brakes, and were built for speed as well as comfort.

Just what disposition will be made of the cars is not known at present. It is probable, however, that they will be kept on one line, for their greater speed will make it impossible to run them in conjunction with the old cars.

Every motorman and conductor in the employ of the company will be made familiar with the operation of the cars. It

is not known exactly when the new cars will be put on their run, for considerable overhauling will be necessary. It may be they will be withheld until the State Fair is closed.—Sacramento Union, September 14, 1914.

Nothing Like Setting a Good Example

SACRAMENTO HIGH SCHOOL.

September 10, 1914.

Mr. C. W. McKillip, Manager,
Pacific Gas and Electric Company,
Sacramento, California.

Dear Sir:

We would be greatly obliged if you would have the glass demonstration gas meter installed in our Physics Department for about a month's time. You will recall that we had it last year and assumed the responsibility for its safe return.

If you are able to comply with our request, we should be glad to have you place it in our laboratory some time this month.

We wish to thank you at this time for the courtesy extended my department by you last spring when you permitted the loan of the electric meters.

We aim to show the pupil the actual working of a meter and explain how it measures gas. Most pupils have a strange notion concerning a gas meter and as we explain the meter we try to show them that you are a public service corporation and that it is to your interest to serve the public with your commodity at a fair charge, and to your disadvantage to antagonize the public by unfair means. We are sure that we are fostering a better feeling toward public service corporations.

Again thanking you for past courtesies, I am,

Very truly yours,

C. RAY BENDER,

Physics Department.

Chico District

The first section of the State Highway in Butte County was commenced about one month ago. It extends north from the city limits to the county line, which is a distance of about eleven miles. The construction consists of the concrete base with an oil screen finish.

Butte County, and particularly around Chico, is harvesting the largest crop of almonds that has ever been gathered in this district. The amount to be shipped is about thirty carloads.

Three thousand acres on the J. D. Phelan ranch, five miles southwest of Chico, will soon be checked, leveled and planted to rice. The same will be irrigated from two 20-inch pumps, driven with 125 h. p. motors each, the water to be taken from the Sacramento River.

Marysville District

Building permits aggregating \$30,000 were granted in September, and soon the city will become the center of a building boom. Nearly all the permits will be for new buildings or additions to business structures in Marysville.

One of the largest land deals to take place in Yuba County in some time has been recently closed. It involves 3160 acres of the best property in the county and is situated along the Southern Pacific Railroad between Marysville and Wheatland. It is also on the new State Highway. The property will be cut up into small holdings and put on the market, which means more power on this line for our Company.

The peach crop resulted in a record shipment from the local cannery in Yuba City, fully 100,000 cases being shipped this season. Work is now being confined to the canning of tomatoes.

Work is progressing rapidly on the new bridge which is being constructed over Butte Slough, in the Western part of Sutter County, and from present indications will be finished within contract time. It will be of concrete and 1920 feet long.

A contract has also been let for the new D Street Bridge, which will be erected alongside of the old one, so as not to interfere with traffic. It is proposed to install electroliers on this bridge.

The Rice Exposition in September in Gridley was a great success. Probably no exposition was so widely commented upon editorially as this one.

Sutter and Yuba counties can shake hands with each other in the quantity and quality of their fruits this season of 1914, and which not only fill the pockets of the rancher, but help "Pacific Service."

The announcement that the big Gugenheim interests are to enter the Yuba County dredging fields has been received in local business circles with a feeling of much warranted optimism and rejoicing.

The expenditure of approximately \$35,000 in prospecting, it is reported, signifies the extensiveness of the preliminary operations of the mining companies and indicates a policy to be thoroughly satisfied that the ground was sufficiently auriferous to warrant the building of a fleet of dredgers before closing negotiations for acquiring the property.

One of the promising results of the approaching mining activity is that several new towns like Hammonton and Mari-

gold will spring up along the river and add material wealth to the district and make Yuba County the leading gold producing community in California, if not in the United States. Even the building of the dredgers will result in the distribution of many hundreds of thousands of dollars in this county, and Marysville will reap a large part of this benefit. As in the case of the building of the dredgers of the Yuba Consolidated Gold Fields Company, most of the machinery for the gold boats will probably be built here.

The mysterious company that has been prospecting north of the newly acquired holdings of the Guggenheims in the Parks Bar District appears to be none other than the Natomas Consolidated. While their plans are not so well known, deals have been practically closed for the purchase of several claims, and it is safe to predict that their activities will be as extensive as the other company, in which event Yuba County will undoubtedly have the biggest fleet of gold boats in the world, commanding territory from Smartsville to as far south as Hammonton and Mari-gold.

That the Arboga District will prove to be one of the most productive in the county is the contention of persons who have recently made trips through practically every portion of the county.

Yolo District

Since the introduction of electric power on the farm, a new feature has developed which has added greatly to the pleasure of farm life.

Mr. Alvis Hunt of Woodland was the first to build a cement swimming tank, which is liberally patronized by the youth of Woodland on Mr. Hunt's invitation.

Mr. G. H. Hecke, also, has a cement swimming tank on his fruit farm about two miles southwest of Woodland, and a mile and a half further down the main highway on the farm of Ed Bullard, Mr. W. L. Wales, formerly an employe of the Pacific Gas and Electric Company, has lately constructed another swimming tank.

As the young people of the farming community jump into one of these modern tanks with its clear sparkling water they exclaim, "I love the cows and chickens, but this is the life for me."

Santa Rosa District

During the week ending September 5th the Sonoma and Marin Agricultural Fair Association held its annual fair, races and stock show. The exhibits were all high-class, there being very many blue-ribbon

cattle, hogs, sheep and horses, both thoroughbred and standard bred, on exhibition. There was a very fine exhibit of poultry, including turkeys, chickens, pigeons, etc. Sonoma County is probably unexcelled for different breeds of poultry.

The tent given up to the farm products exhibit was packed with many fine features, among those particularly noticeable being a hopvine Ferris wheel and an apple water-wheel, the latter the exhibit of the Sebastopol section. The streets of the town were handsomely decorated with streamers of colored electric lights and imitation Jack o'Lanterns. The trolley poles all up and down Fourth street were hidden by immense shocks of Indian corn with the ears thereon. The regulation street fakers and sideshows were grouped around the court house.

The annual apple show held at Sebastopol proved an unusual success this year. To meet the extra demands upon its lighting system "Pacific Service" established three transformers at the entrance to the large pavilion. That our company helped out in other ways may be taken from the following letter received by Manager M. G. Hall:

"Sebastopol, Cal., Aug. 12, 1914.

"Pacific Gas and Electric Co.,
Santa Rosa, Cal.

"Gentlemen—On behalf of the ladies of the Congregational Church of Sebastopol, I extend to you our thanks and most sincere appreciation for your very generous donation of gas, which was used in baking pies at our Apple Show last week. Without this donation we would have been unable to conduct the pie booth. Again thanking you, I remain,

"Very truly,

"Mrs. B. J. MORFORD."

The proposed underground wire ordinance, which has caused no little discussion in the community, was defeated by a vote of four to two at a special meeting of the City Council held Tuesday evening, September 29th, after a debate in which representatives of various corporations directly interested gave their views.

"Pacific Service" was represented by Mr. L. H. Newbert, manager of the Sales Department, and Mr. C. H. Wilson, Assistant Engineer of Electric Distribution. Both gentlemen presented figures to show that the proposed change would be extremely costly to the company and that existing conditions did not warrant the expense. Statements of a similar character were made by Mr. W. W. Briggs of the Great Western Power Company and by Mr. T. Teague and E. G. Long of the Pacific Telephone and Telegraph Company.

The ordinance under discussion provided that all wires within the fire limits

should be placed underground within five years, and that all wires without these limits should be placed on one set of poles by 1916.

Luther Burbank was tendered a public reception at Santa Rosa, September 23d, upon his return from a visit to his old home at Lancaster, Mass.

The ceremonies were held on the lawn of the Burbank residence. The address of welcome was given by Charles E. Lee, who presented Mr. Burbank with a solid silver loving-cup.

There was an automobile parade and a turnout of school children. In returning thanks, Mr. Burbank said: "I have visited many beautiful places during my visit, but I have returned to my home again in the most beautiful place of all."

Solano District

Mr. Barbour and Mr. Anderson, two young men from Mr. Lisberger's office, have been testing pumping plants in this district. The office has had several inquiries from farmers as to the results of their tests, showing that they are interested in knowing what is "doing."

A very complete set of graphic records is being taken of loads on lines out of Dixon sub-station, supplying pumping plants, with a view to getting more exact information on the character of this class of load.

Here is something that sounds worth while:

Colusa, Cal., July 18, 1914.

Mr. John A. Britton,

General Manager, P. G. & E. Co.,
San Francisco, Cal.

Dear Sir—I write you because I wish to express my appreciation of the kind of personal service your company is furnishing its patrons. In Dixon I have a pumping plant which has given me serious trouble for several months, making irrigation practically impossible. The pump men in Dixon were unable to locate my trouble, and a man I had come from San Francisco was likewise unable to effect any improvement. I finally went to your local manager, Mr. C. E. Sedgwick, explained the whole situation to him, and asked him if he could do anything to solve my problem, or could refer me to one who could. He at once showed a decided interest in the case and began a series of experiments, which resulted in putting the plant in working operation again.

Knowing how ready men are to send in complaints if anything does not suit them, and how commonly nothing is said so long as conditions are satisfactory, I take pleasure in letting you know my appreciation of the disposition and the ability

of your Dixon manager in meeting the needs of your company's customers.

Sincerely yours,

H. T. DOBBINS.

Fresno District

August was an extremely busy month for all the packing houses. However, plenty of labor was available, and the immense crops of the different fruits have been handled readily. Although the raisin crop this year is larger than has been known for a great many years, the Raisin Association believes that it will be readily marketed and at good prices.

Building is picking up rapidly, and we look for a great many more residences to go up this fall, as well as buildings in the business district.

Mr. David Martin, cashier of this district, was married September 23d to Miss Ruth Turner, of Palo Alto. Both are Stanford graduates. Mrs. Martin was formerly secretary and business manager of the Castillejo School in Palo Alto.

Colusa District

Our gas department has finished laying 6500 feet of four-inch and two-inch gas main for improvement of service and taking on new consumers.

The plans of the new Colusa County Hall of Records calls for gas heating by a Rector system. This will be the first if not the only, public building in the Sacramento Valley to use gas for heating entirely.

The rice industry of Colusa County has increased rapidly in the last year. At the present time it requires 350-horsepower in motors to irrigate the crops on the Moulton Irrigated Lands Company's property alone.

Stockton Water District

An \$80,000 contract for the improvement of streets in "The Oaks" tract has been let to the Federal Construction Company.

The suction dredger Wilmington, belonging to the North American Dredging Company, will soon begin dredging Stockton Channel from the city limits to Smith's Canal, a distance of about four miles.

Fire insurance rates are being reduced in Stockton by the underwriters, due to the improved fire fighting equipment of the city fire department and the increased water facilities, consisting of an enlargement of our water distributing system and the duplication of all parts of the pumping equipment.

Placer District

Twenty per cent of all the deciduous fruit has been shipped out of the state. This represents the fruit industry of Newcastle, a town of perhaps 300 population in Placer District.

De Sabla District

Lee I. Spangler, foreman at Centerville power-house, is known to be an accomplished grafter. Now, this must not be taken in the offensive sense—it means only that Mr. Spangler occupies his spare time in Centerville by growing fruit trees on the edge of the stream in front of the power-house, and that he has done wonders in the way of grafting one fruit on to another, so that he has the most mixed up orchard in California. He is very proud of it and shows it to all comers.

And now he has turned out to be an angler of note. In evidence of this we produce the following clipping from the Chico Record of recent date:

Lee Spangler, who lives on the Centerville grade along Butte creek, below Nimsbush, has the only trained trout in captivity. This fish is trained to not one, but several tricks. This is the statement that U. M. Damon is willing to make upon an affidavit:

"Spangler caught the trout a year ago and placed it in a spring about four feet deep and four feet wide in a bank beside the road. The fish is now ten inches long.

"Naturally Spangler has been forced to the expedient of feeding the trout. He can hold a grasshopper in his fingers from fourteen to sixteen inches above the water and the fish will rise from the water and invariably snatch the insect from his hand. Another trick of the trout is to circle about a person's finger when it is placed in the water and to pinch it in his mouth."

San Francisco District

The Cogswell Polytechnic College and the Lick School of Mechanical Arts have each had a class of their students visit the big steam turbine power plant, known as Station "A," recently. They were shown every courtesy by the operating engineers, and the young visiting student engineers went home with better ideas as to how "Pacific Service" is generated.

Mr. and Mrs. A. J. Vander White celebrated the twenty-fifth anniversary of their marriage at their home in Downey street on Thursday, August 6th.

They were the recipients of many beautiful gifts, most of which were of silver, in honor of the occasion.

Mr. Vander White has been employed in the Gas Department of the company

for a number of years. Our congratulations and good wishes are extended to them.

On Saturday evening, July 25th, Mr. Altmyer, of the Farnsworth Electric Company, gave a lecture on dynamos and motors before the "Pacific Service" Club in the assembly rooms, 246 Pacific building.

Mr. Altmyer, who is a specialist in his line, gave a lecture which, if it had been given even before a meeting of the foremost electrical engineers of the country, would have ranked as a classic.

Mr. Altmyer's lecture brought up so many questions on the subject of electrical generation that the next lecture was arranged to revert again to "Magnetism," which was ably expounded by Mr. Baloun, our chief draftsman, on the evening of August 8th. Mr. Baloun's collection of models, by which he demonstrated the different points of his lecture, were very much admired.

Mr. C. A. Gaines, of the Electric Distribution Department, delivered a very interesting and educational lecture on Ohm's law and electrical instruments on August 22d, 1914. From the discussion that followed, it was quite evident that Mr. Gaines' talk was closely observed by the members.

Samuel Stern, for many years an employee of the Stationery Department, is now stenographer for Dr. Frederick J. V. Skiff, director-in-chief of the Panama-Pacific Exposition. He made this change August 1st. He was for several years in the employ of "Pacific Service," and left with the best wishes of all who knew him.

In Memoriam

WM. H. COGHILL

It is with feelings of deep regret that we report the death of Wm. H. Coghill, a member of the Collection Department, of the San Francisco District.

Mr. Coghill was born in San Francisco about fifty-eight years ago, and was considered one of the "old-guard," coming to work originally with the San Francisco Gas Company in 1879.

He had been in poor health for some time, and about a year ago gave up active work. On October 2d he passed away, leaving a widow and daughter, and the company extends to them its sympathy in their bereavement.

PACIFIC GAS AND ELECTRIC COMPANY

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JOHN A. BRITTON
W. H. CROCKER
F. G. DRUM

JOHN S. DRUM
F. T. ELSEY
D. H. FOOTE
J. E. GLADSTONE
W. G. HENSHAW

A. F. HOCKENBEAMER
SAMUEL INSULL
JOHN D. MCKEE
C. O. G. MILLER
GEORGE K. WEEKS

OFFICERS

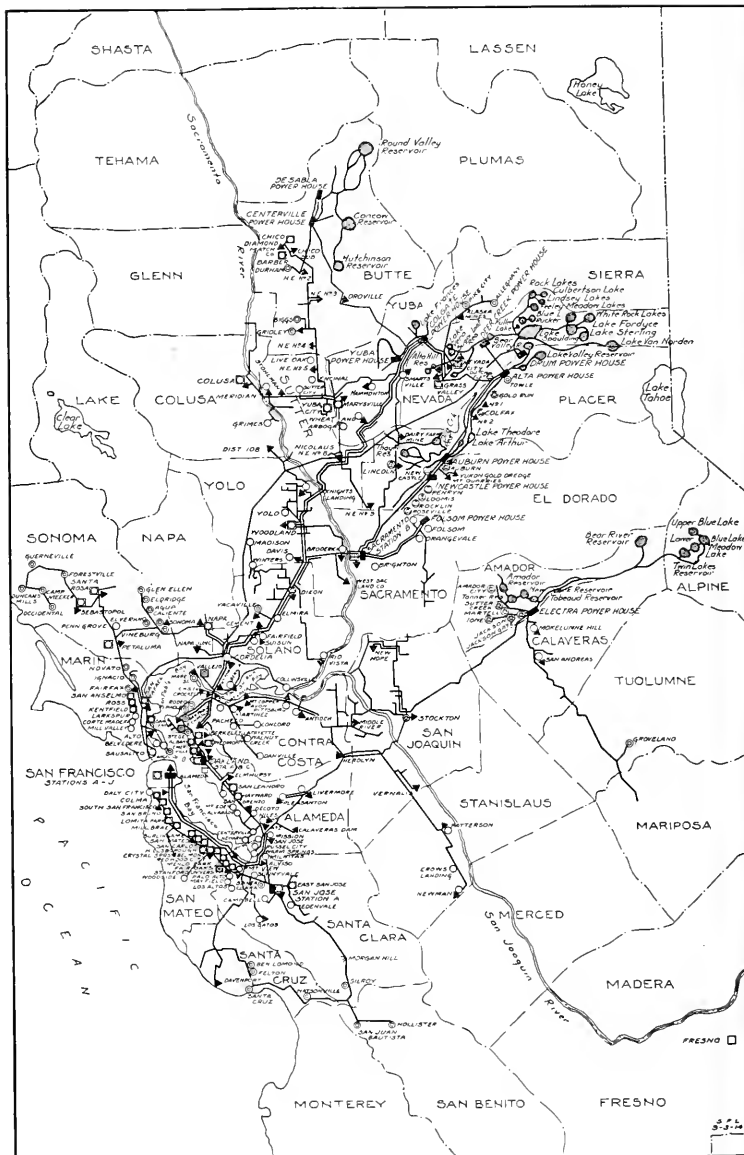
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F. G. BAUM	Chief Engineer Electrical Construction
W. B. BOSLEY	Attorney
M. H. BRIDGES	Auditor
R. J. CANTRELL	Property Agent
J. P. COGHLAN	Manager Claims Department
P. M. DOWNING	Engineer O. & M. Hydro-Elec. Department
E. B. HENLEY	Manager Land Department
JNO. H. HUNT	Purchasing Agent
J. P. JOLLYMAN	Engineer Electrical Construction
E. C. JONES	Engineer Gas Department
W. H. KLINE	General Agent
S. J. LISBERGER	Engineer Electrical Distribution
F. S. MYRTLE	Manager Publicity Department
L. H. NEWBERT	Manager Sales Department
GEO. C. ROBB	Superintendent of Supplies
F. H. VARNEY	Engineer O. & M. Steam-Elec. Department
H. C. VENSANO	Civil and Hydraulic Engineer
W. G. VINCENT, JR.	Valuation Engineer
S. V. WALTON	Manager Commercial Department

DISTRICT MANAGERS

<i>District</i>	<i>Headquarters</i>	<i>Manager</i>
ALAMEDA COUNTY	Oakland	F. A. LEACH, JR.
CHICO	Chico	H. B. HERYFORD
COLGATE	Colgate	MILES WERRY
COLUSA	Colusa	L. H. HARTSOCK
CONTRA COSTA	Martinez	DON C. RAY
DE SABLE	De Sable	I. B. ADAMS
DRUM	Colfax	JAMES MARTIN
ELECTRA	Electra	W. E. ESKEW
FRESNO	Fresno	M. L. NEELY
MARYSVILLE	Marysville	J. E. POINGDESTHE
MARIN	San Rafael	W. H. FOSTER
NAPA	Napa	C. D. CLARK
NEVADA	Nevada City	JOHN WERRY
PETALUMA	Petaluma	H. WEBER
PLACER	East Auburn	H. M. COOPER
REDWOOD	Redwood City	E. W. FLORENCE
SACRAMENTO	Sacramento	C. W. MCKILLIP
SAN FRANCISCO	San Francisco	GEO. C. HOLBERTON
SAN JOAQUIN	Stockton	E. C. MONAHAN
SAN JOSE	San Jose	J. D. KUSTER
SANTA ROSA	Santa Rosa	M. G. HALL
SOLANO	Dixon	C. E. SEDGWICK
STANISLAUS	Newman	W. A. WIDENMANN
STOCKTON WATER	Stockton	J. W. HALL
VALLEJO	Vallejo	A. J. STEPHENS
YOLO	Woodland	W. E. OSBORN



PACIFIC GAS AND ELECTRIC COMPANY

CITIES AND TOWNS SUPPLIED WITH GAS,
ELECTRICITY, WATER AND RAILWAY

SERVICE FURNISHED	NUMBER OF CITIES AND TOWNS SERVED BY COMPANY			TOTAL POPULATION
	DIRECTLY	INDIRECTLY	TOTAL	
Electricity.....	126	49	175	1,220,238
Gas.....	48	2	50	1,125,068
Water (Domestic).....	9	11	20	58,710
Railway.....	1	..	1	75,602

Place	Population	Place	Population	Place	Population
¹ Alameda.....	27,000	³⁴ Gold Run.....	100	² Piedmont.....	1,720
¹ Albany.....	800	³⁵ Grass Valley.....	4,500	³ Pike City.....	200
⁶ Amador City.....	200	³⁶ Gridley.....	1,800	⁴ Pinole.....	1,500
¹ Alleghany.....	200	³⁷ Grimes.....	250	⁵ Pittsburg.....	2,372
¹ Alviso.....	200	³⁸ Groveland.....	125	⁶ Pleasanton.....	2,000
¹ Angel Island.....	280	³⁹ Hermesville.....	500	⁷ Port Costa.....	600
¹ Atherton.....	250	⁴⁰ Hammononton.....	500	⁸ Redwood City.....	3,200
⁶ Auburn.....	2,375	⁴¹ Hayward.....	4,000	⁹ Richmond.....	10,000
¹ Agua Caliente.....	100	⁴² Hillsborough.....	1,000	¹⁰ Rio Vista.....	884
¹ Alvarado.....	900	⁴³ Hollister.....	3,000	¹¹ Rocklin.....	1,000
¹ Antioch.....	3,000	⁴⁴ Ignacio.....	100	¹² Roseville.....	2,600
¹ Arboga.....	100	⁴⁵ Ion.....	900	¹³ Rodeo.....	500
¹ Barber.....	500	⁴⁶ Irrington.....	1,000	¹⁴ Ross.....	500
¹ Belmont.....	350	⁴⁷ Jackson Gate.....	100	¹⁵ Russell City.....	250
¹ Ben Lomond.....	800	⁴⁸ Jackson.....	2,035	¹⁶ Sacramento.....	75,602
¹ Belvedere.....	1,000	⁴⁹ Kentfield.....	250	¹⁷ San Andreas.....	200
¹ Benicia.....	3,360	⁵⁰ Knights Landing.....	350	¹⁸ San Anselmo.....	1,500
¹ Berkeley.....	53,000	⁵¹ Knighten.....	125	¹⁹ San Bruno.....	1,500
¹ Biggs.....	750	⁵² Lafayette.....	100	²⁰ San Carlos.....	530,000
¹ Bollnas.....	500	⁵³ Live Oak.....	200	²¹ San Francisco.....	37,946
¹ Brighton.....	100	⁵⁴ Livermore.....	2,250	²² San Jose.....	4,000
¹ Broderick.....	200	⁵⁵ Los Gatos.....	3,000	²³ San Leandro.....	100
¹ Burlingame.....	4,300	⁵⁶ Larkspur.....	600	²⁴ San Lorenzo.....	6,500
¹ Camp Meeker.....	200	⁵⁷ Lincoln.....	1,400	²⁵ San Mateo.....	2,500
¹ Campbell.....	600	⁵⁸ Lomita Park.....	100	²⁶ San Quentin.....	6,000
¹ Centerville.....	20	⁵⁹ Los Altos.....	500	²⁷ San Rafael.....	1,000
¹ Chico.....	13,000	⁶⁰ Loomis.....	400	²⁸ San Pablo.....	6,000
¹ Collinsville.....	150	⁶¹ Madison.....	250	²⁹ Santa Clara.....	16,000
¹ Colma.....	3,500	⁶² Madrone.....	125	³⁰ Santa Cruz.....	10,500
¹ Colusa.....	1,500	⁶³ Martinez.....	5,000	³¹ Santa Rosa.....	1,200
¹ Concord.....	1,500	⁶⁴ Martell.....	7,000	³² Sebastopol.....	2,500
¹ Cement.....	500	⁶⁵ Marysville.....	1,500	³³ Sausalito.....	500
¹ Colfax.....	150	⁶⁶ Mayfield.....	300	³⁴ Sheridan.....	2,500
¹ Cordelia.....	375	⁶⁷ Menlo Park.....	1,500	³⁵ Smartsville.....	2,000
¹ Corte Madera.....	2,500	⁶⁸ Meridian.....	300	³⁶ South San Francisco.....	2,600
¹ Crocket.....	375	⁶⁹ Millbrae.....	300	³⁷ Stanford University.....	1,200
¹ Crow's Landing.....	250	⁷⁰ Millitas.....	2,500	³⁸ Stevenson.....	1,000
¹ Daly City.....	250	⁷¹ Mission San Jose.....	500	³⁹ Stockton.....	35,000
¹ Danville.....	750	⁷² Mokelumne Hill.....	150	⁴⁰ Suisun.....	1,200
¹ Davis.....	350	⁷³ Morgan Hill.....	500	⁴¹ Sutter City.....	150
¹ Decoto.....	1,000	⁷⁴ Mountain View.....	2,500	⁴² Sutter Creek.....	1,500
¹ Dixon.....	1,000	⁷⁵ Mt. Eden.....	200	⁴³ Sunnyvale.....	400
¹ Davenport.....	500	⁷⁶ Mare Island.....	500	⁴⁴ Tiburon.....	100
¹ Durham.....	500	⁷⁷ Napa.....	7,500	⁴⁵ Towle.....	1,200
¹ Dutch Flat.....	500	⁷⁸ Nevada City.....	2,700	⁴⁶ Vacaville.....	1,200
¹ Duncan's Mills.....	150	⁷⁹ Newark.....	700	⁴⁷ Vallejo.....	13,600
¹ Eldersville.....	500	⁸⁰ Newcastle.....	750	⁴⁸ Vineburg.....	200
¹ Elmira.....	150	⁸¹ Newman.....	1,000	⁴⁹ Walnut Creek.....	350
¹ El Verano.....	400	⁸² Niles.....	200	⁵⁰ Warm Springs.....	200
¹ Emeryville.....	5,000	⁸³ Novato.....	250	⁵¹ Watsonville.....	4,500
¹ Encinal.....	100	⁸⁴ Oakland.....	215,000	⁵² Wheatland.....	1,400
¹ Fairfax.....	500	⁸⁵ Occidental.....	400	⁵³ Winters.....	1,200
¹ Fairfield.....	834	⁸⁶ Orange Vale.....	100	⁵⁴ Woodland.....	5,500
¹ Forestville.....	100	⁸⁷ Palo Alto.....	6,300	⁵⁵ Woodside.....	200
¹ Felton.....	300	⁸⁸ Pacheco.....	200	⁵⁶ Yolo.....	400
¹ Fresno.....	40,000	⁸⁹ Penryn.....	250	⁵⁷ Yuba City.....	1,200
¹ Folsom.....	1,800	⁹⁰ Patterson.....	300		
¹ Gilroy.....	2,000	⁹¹ Penn Grove.....	300		
¹ Glen Ellen.....	500	⁹² Petaluma.....	5,500		

Unmarked—Electricity only.

—Gas only.

—Gas and Electricity.

—Gas, Electricity and Water.

—Gas, Electricity and Street Railways.

¹—Electricity and Water.²—Electricity supplied through other companies.³—Gas supplied through other companies.⁴—Water supplied through other companies.

EMPLOYS approximately 5,000 people.

OPERATES 10 hydro-electric plants in the mountains.

4 steam-driven electric plants in big cities.

17 gas works.

SERVES $\frac{1}{2}$ of California's population

30 of California's 58 counties.

An area of 37,775 square miles.

 $\frac{1}{2}$ the size of New York State $\frac{1}{2}$ the size of all the New England States combined

Humphrey Gas Mantles



Are especially made to stand **Hard Maintenance Service**, and will materially assist in reducing arc maintenance cost because of their superior strength, durability and quality.

ALL HUMPHREY MANTLES
ABSOLUTELY GUARANTEED

General Gas Light Company
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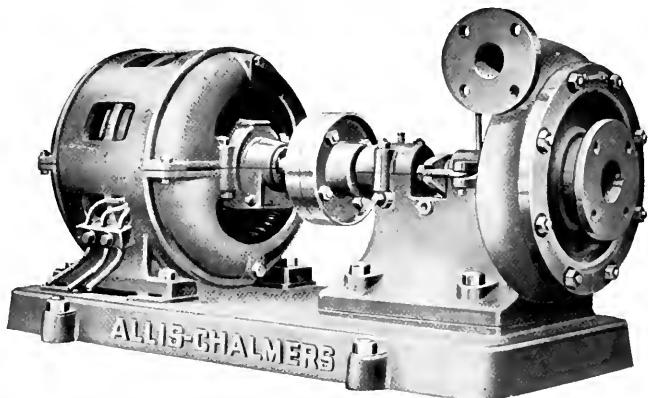
C. B. BABCOCK
Manager

KALAMAZOO

NEW YORK

NEW TYPE "SS" CENTRIFUGAL PUMPS

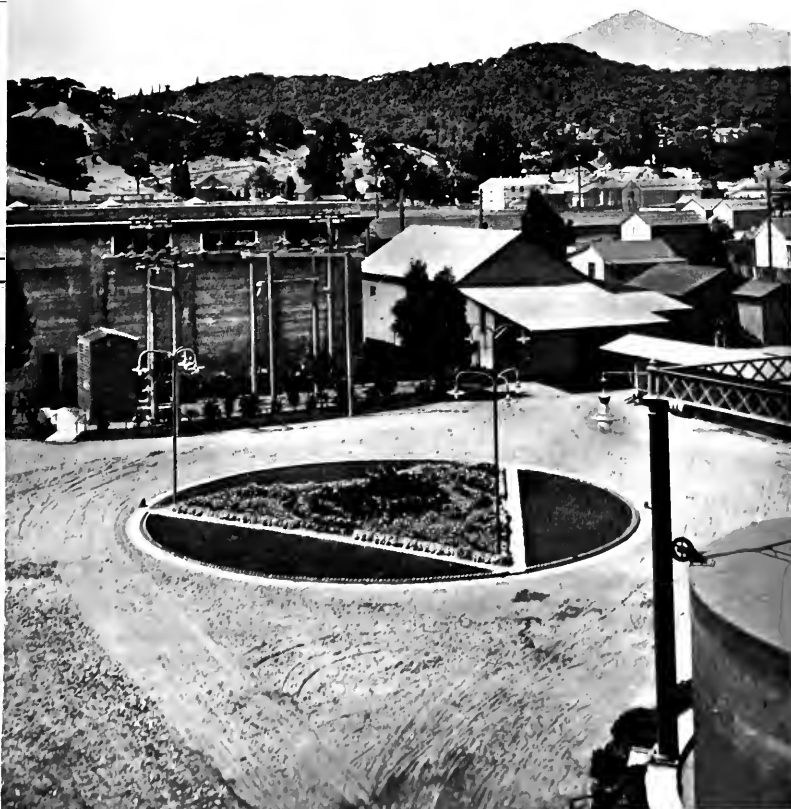
HIGH EFFICIENCY—MOTOR DRIVEN—DIRECT CONNECTED



PUMPS FOR IRRIGATION SERVICE—MINE WORK—DRAINAGE
CIRCULATING PUMPS—BOILER FEED—FOR ALL CAPACITIES AND HEADS
ALLIS-CHALMERS MANUFACTURING COMPANY, RIALTO BUILDING
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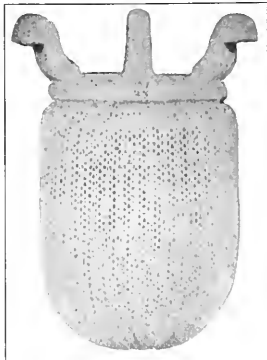


PACIFIC SERVICE MAGAZINE

NOVEMBER • 1914

Published Monthly by the Pacific Gas and Electric Co., San Francisco, Cal.

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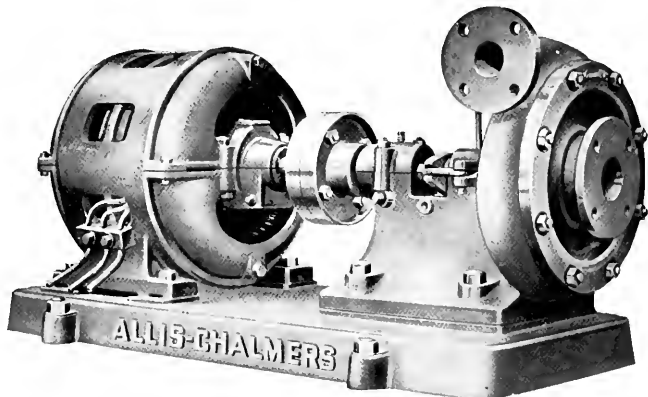
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PACIFIC SERVICE MAGAZINE, VOL. 6, NO. 6, NOVEMBER, 1914

Vol.
6

NOVEMBER • 1914

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Published Monthly by the Pacific Gas and Electric Co., San Francisco, Cal.

The Pacific Telephone and Telegraph Company

GOOD SERVICE AT FAIR RATES

Reports

Construction

Designs

J. G. White Engineering Corporation

ALASKA COMMERCIAL BUILDING
SAN FRANCISCO

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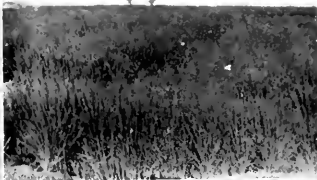
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Contents for November

RICE-CULTURE IN BUTTE COUNTY, CALIFORNIA	<i>Frontispiece</i>
CALIFORNIA'S RICE INDUSTRY, AN INFANT TO BE SURE, BUT A MOST PROMISING ONE	<i>H. B. Heryford . 179</i>
IRRIGATION OF RICE IN BUTTE COUNTY	<i>Ralph R. Robertson 181</i> <i>(U. S. Department of Agriculture)</i>
A WELCOME TRIBUTE FROM A COMPETENT AUTHORITY	<i>183</i>
EXPLOITING THE SAND AND GRAVEL DEPOSITS OF ALAMEDA CREEK; THE NILES SAND, GRAVEL AND ROCK CO.	<i>S. V. Walton . 184</i>
ACTIVITIES OF "PACIFIC SERVICE" TENNIS CLUB.	<i>187</i>
THE EFFICIENCY OF A STEAM POWER PLANT WHEN OPERATING IN PARALLEL WITH THE HYDRO-ELECTRIC SYSTEM	<i>E. A. Rogers . 188</i>
THE JAMES HUGH WISE LIBRARY	<i>J. P. Baloun . 191</i>
"SAFETY FIRST" CAMPAIGN NOW COMPLETELY ORGANIZED	<i>192</i>
CARBON FUEL FOR DOMESTIC USE	<i>John A. Britton, Jr. 193</i>
THE FARM ADVISER MOVEMENT	<i>R. E. Fisher . 196</i>
IN MEMORIAM—CHAS. MOORE CONVERSE.	<i>197</i>
ITEMS FROM WOMEN OF THE COMPANY DOINGS OF "PACIFIC SERVICE" SECTION, N. E. L. A.	<i>E. B. Price . 199</i>
BASERALL EXTRA! OPPOSING ARMIES IN THE FIELD	<i>200</i>
THE FINANCIAL SIDE OF "PACIFIC SERVICE"	<i>A. F. H. . 202</i>
EDITORIAL	<i>204</i>
TIDINGS FROM TERRITORIAL DISTRICTS.	<i>207</i>

Index to Advertisers

Allis Chalmers Mfg. Co.	ii	Patrick & Co.	viii
Associated Oil Co.	iii	Pelton Water Wheel Co.	viii
Bonbright, William P., & Co.	i	Pierson, Roeding & Co.	vi
Byron Jackson Iron Works	vii	Remington Typewriter Co.	x
Chaplin-Fulton Mfg. Co.	vii	Roebing's, John A., Sons Co.	iii
Cities and Towns Supplied by "Pacific Service"	3d page cover	Schaw-Batcher Co.	viii
General Electric Co.	ix	Sprague Meter Co.	iii
General Gas Light Co.	ii	Standard Underground Cable Co.	vii
Halsey, N. W., & Co.	4th page cover	Steiger & Kerr Stove & Foundry Co.	vi
Johns-Manville, H. W., Co.	v	Wagner Electric	vii
Map of Company's System	xii	Westinghouse Electric & Mfg. Co.	x
Pacific Gas and Electric Company Officers	vi	Welsbach Company	ix
Pacific Telephone & Telegraph Co.	2d page cover	White, J. G., Engineering Corporation	x
		Wood, R. D., & Co.	x



Rice-culture in Butte County, California. Reading from top to bottom, left to right, the views show : 1 and 2, rice-field near Chico; 3, rice-field at Richvale; 4, ditch after water leaves pumping plant; 5 and 6, pumping plants at Richvale.

California's Rice Industry, an Infant, to Be Sure, But a Most Promising One

By H. B. HERYFORD, Manager Chico District

CALIFORNIA'S newest industry, which has bright promise of being one of its greatest, was given birth in Butte County only four years ago. Today the rice crop of Butte County is worth \$2,000,000. Fourteen thousand acres were planted in rice in the county this year, and preparations are in progress for the planling of several thousand more acres next year.

The largest rice district of the county, which means the largest in the state, ranges from Nelson south through Richvale to Biggs. These three small towns no longer talk wheat and barley. Their principal thought is rice. There is also considerable rice near Gridley, while not far from Chico the James D. Phelan ranch will plant 3000 acres to rice next year.

In the development of the rice industry "Pacific Service" plays no inconsiderable part. Its power operates pumps which irrigate 2000 acres at Richvale. From Hazelbusch, on the Feather river, a large ditch carries water to Richvale, where it is pumped from the large ditch into service ditches by two 16-inch pumps, operated by two 75 h. p. motors. These pumps lift 20,000 gallons of water a minute 8 feet into the service ditch, constantly from July to October, during which season the rice fields are submerged.

Rice has been grown in the United States on a small scale for 200 years, but since the civil war its production has been a factor in the striking development of the South. Rice land is land which will hold water. Those thousands of acres of adobe lands in the Sacramento



H. B. Heryford

valley, so long held in contempt, will hold water, and four years ago B. L. Adams, now in charge of the government rice experiment station at Biggs, discovered that they would grow rice.

Land that was appraised at \$15 an acre four years ago now is worth more than \$100. Last year the rice lands in Butte County paid from \$30 to \$50 an acre net. The net profit is expected to grow as the producers gain in experience, for the yield in the Sacramento valley is declared to be greater even than that of the Southern states per acre.

California is just awakening to the fact that lands not long ago almost worthless now give great promise for the future through rice culture. Her eyelids were pried open a bit by the recent Butte County Rice Exposition held in Gridley, where rice in its various stages of growth, the finished and unfinished product and a score of bi-products, were on display. This was the first rice fair ever held north of the Mason and Dixie line.

The development of the rice industry has not been accomplished without encountering difficulties. Chief among these has been the delay in planting or in applying the water upon which the success of the rice plantation depends. It is important that the rice be planted early, in order that it may be harvested and threshed before the winter rains begin. Because of late planting and lack of machinery a considerable quantity of last year's crop was caught by the early rains and suffered some damage. The experience led to earlier planting this year and increased provision for harvesting. This setback did not daunt the rice man, how-



ever. The rice berry is hard and does not absorb water readily. Much which went through the rain while standing in the shock was only partially damaged. When the rainy season passed, it was threshed and milled, bringing a price at least sufficient to return the cost of growing.

The only weed pest of any importance is water grass, commonly known as barnyard grass or wild millet. This must be pulled out by hand, but if not neglected offers no serious problem. It can be held in check at slight expense.

With the development of the industry has come a new demand for harvesting machinery, which has kept the implement men busy. In Biggs and Richvale at present stands scores of binders and separators awaiting the rice harvest in the late fall.

The rice fields in Louisiana yield from 1200 to 2500 pounds per acre. In Butte County they yield from 2000 to 5000 pounds per acre. Opportunity! Is there at present a greater one in California for

the upbuilding of thriving communities where once were tractless wastes?

Not Confined to Butte County

The foregoing article deals only with the progress of the rice industry in Butte County. It is not alone in its glory, however, for in each of the adjoining counties of Yuba and Colusa a large area was planted to rice this year. Mr. R. E. Fisher of the Commercial Department attended the rice carnival held at Gridley in September and gathered some very valuable and accurate information concerning the industry. It was found that the area devoted to rice this season in the various localities was as follows:

Richvale colonies, 5,500 acres; Biggs district, 3,000 acres; Gridley district, 3,500 acres; Moulton district, 3,000 acres; Brown's Valley district, 1,000 acres; a total of 16,000 acres.

In addition to irrigating, power is furnished for the rice mills that are being established throughout these districts.

Irrigation of Rice in Butte County Irrigation Investigations

By RALPH D. ROBERTSON

Office of Experiment Stations, U. S. Department of Agriculture

THE most essential feature or requisite in the growing of rice is the assurance of an abundant and unfailing water supply, especially in the late summer months when the crop is maturing. In this respect the rice lands of Butte County are particularly favored, as they have as their source of water supply the Feather river, which has the largest annual discharge of any single stream in California. The mean annual flow of the Feather river at Oroville is about 6,000,000 acre feet.

Water is delivered to the rice fields of Butte County by the Sutter-Butte Canal Company, the supply being taken from Feather river about ten miles above Gridley. The system comprises over 100 miles of main canals and laterals and supplies

water to about 33,000 acres of land, of which approximately 12,000 acres are in rice in 1914. To secure water from this system it is necessary to locate a water-right on the piece of land to be irrigated. The initial cost is \$10 per acre and the annual rental charge for rice is \$5 per acre. The water-right contracts call for a continuous flow of one cubic foot per second for each 53 1/3 acres of rice. Owing to an abundance of water in the canals no attempt has been made to measure water to irrigators, and this has resulted in an extravagant use of water. This must be evident to anyone who sees the enormous waste of water along the roadsides. The fullest irrigation development will never be attained here until the water is sold to irrigators at so much





per acre foot or quantity actually delivered, rather than on a flat rate per acre as is the practice today.

It has been found in the southern rice-growing states that the number of days for maturing a crop can be greatly lessened by stimulating the growth at the time the plant begins to "boot" by increasing the depth of water for a few days, then gradually lowering, and again by suddenly increasing the depth of water just as the head appears. Whether this method will apply here is a problem that will have to be worked out. Probably the most critical period in the irrigation of rice in this valley is in the first and second waterings. It is essential at this time that the fields be rapidly drained. This is due to the danger of rotting the seed if the water is allowed to remain on the field.

One very important factor in the irrigation of rice is to have the land well prepared to receive water. The fields in Butte County are prepared by the contour method, the checks ranging in size

from 2 to 12 acres, and averaging about 5 acres. The size of the checks will naturally depend upon the fall and topography of the land, but as a rule a difference in elevation of from 3 to 5 inches between checks will be found satisfactory. The outside levees should have a base of at least 6 feet, a width on top of 2 feet, and be from 2 to 2.5 feet high. The most satisfactory levees are made with a Fresno scraper, although the interior levees can often be made more cheaply with an implement known as a crowder or pusher. There are also various forms of land levelers on the market that do satisfactory work. Much of the land now in rice is poorly prepared, as evidenced by the fact that some places receive too much water, resulting in drowning out the crop, while other spots are too high to receive enough.

The importance of rapidly draining the rice field during the early stages of the growth of rice has already been alluded to. Facilities for drainage are, in fact, as important as for irrigation. Drainage is



but a corollary of irrigation; the two go hand in hand, and the success of the rice industry here will depend largely upon the attention that is given to removing surplus waters and relieving water-logged lands. A prominent engineer is said to have been sent to foreign countries to investigate rice-growing conditions and to find out how it was possible to grow rice on the same land year after year. His first report, it is said, was cabled in one word, "Drainage." Whether or not

this story is true, it well illustrates the necessity of the case.

The opening up of natural water-courses and the construction of a comprehensive drainage system in keeping with the flood control work now being undertaken in the Sacramento valley will have an important bearing upon the rice industry in California. There is already a movement on foot to organize a drainage district for the Gridley section which should receive the support of every irrigator.

A Welcome Tribute from a Competent Authority

RAILROAD COMMISSION OF THE STATE OF CALIFORNIA,
833 Market Street, San Francisco.

PACIFIC GAS AND ELECTRIC COMPANY,
445 Sutter Street,
San Francisco.

October 20, 1911.
L. C. 3569.

Gentlemen:

The Commission is in receipt of a communication from Mr. C. F. George, of Esposito, California, advising that they are now receiving electric service and in which he states, "The Pacific Gas and Electric Company have done everything to make this a complete job for the people here and we are more than pleased for their efforts."

We desire to thank you for the very satisfactory settlement reached in this matter.

Yours truly,
RAILROAD COMMISSION OF THE STATE OF CALIFORNIA.
By CHARLES B. DEDRICK, *Secretary*.

LSR:L.



Alameda Creek and its sand and gravel deposits from which fine quality concrete is made. Reading from top to bottom: Niles River, showing sand and gravel deposits; substation and bins; view of plant; showing boulders and main plant of the Niles Sand, Gravel and Rock Co.

Exploiting the Sand and Gravel Deposits of Alameda Creek by the Niles Sand, Gravel and Rock Co.

Nature and "Pacific Service" Combine Successfully to Swell the Record of Concrete Construction Achievements in North-Central California

By STANLEY V. WALTON, Manager Commercial Department

NATURE and "Pacific Service" form an interesting as well as successful combination that is taking large quantities of sand, gravel and rock from the bed of Alameda creek, near the town of Niles, in Alameda County, to aid the purposes for which such material is used in various places, such as road, bridge and building construction, or wherever concrete is used for any purpose. The process, in addition to being unique, is also profitable to those who are carrying on the work.

There are two plants, the first to be installed being that of the California Building Material Company, which began operations in 1909, and the other, the Niles Sand, Gravel and Rock Company, which was placed in operation in the summer of 1912. The pictures shown are of the plant of the last named company, and were furnished by Mr. W. H. Ford, president of the company and a well-known San Franciscan who has a beautiful country home near Niles.

The Alameda creek at Niles is quite wide, as shown in the full-page illustration, and the bed is filled with a deposit of sand and gravel washed down from the hills by the heavy rains of



S. V. Walton

many years. There are also some very large boulders, as shown in the same illustration, which also gives a view of the main plant. A large amount of earth is mixed in with the sand and gravel, and this must be washed out, the sand separated from the gravel and the gravel itself separated by means of large revolving screens into the various sizes that are commercially valuable. Those that are too large to sell are run through crushers and make a very fine grade of crushed rock.

Another illustration shows a large Lidgerwood dragline excavator operated by electric motors. This excavator runs on rollers, and by means of the long boom gathers the material and deposits it in the cars that carry it up the inclined cable railway hoist where it is dumped into a hopper and fed on to the belt-conveyor that takes it to the top of the plant. The motor installation on the excavator consists of a 112-horsepower motor to operate the dragline bucket, a 22-horsepower motor for revolving the excavator and two small motors of four and a half and six horsepower, respectively, direct-connected to air compressors to furnish air to operate the



Lidgerwood dragline excavator. Niles concrete bridge in the distance. An electric hoist and cable now moves the cars. Horses have long since been discontinued.

brakes. As far as we know, this excavator when put in service was the first of its kind to be operated with electric power.

A general view of the plant shows the inclined railway hoist, the hopper and belt-conveyor to the top of the crushers. The large storage bins are in the rear and are better shown in the picture, which also shows the railway track from the main Southern Pacific line and the method of loading by gravity from the large bins. The loaded cars of material are hauled up the incline by a steel rope around a drum, the power for which is furnished by a 75-horsepower motor. The belt-conveyor consists of a conveyor-belt thirty inches wide, and is also operated by a 75-horsepower motor.

When the material, earth, sand, gravel and rock, has reached the top of the main plant those rocks over certain dimensions are passed down to the crushers and reduced to a proper size. The balance of the material is carried across to the top of the bins, the dirt is washed out by means of streams of water through nozzles and the sand separated from the gravel which, in turn, is run through long revolving screens to get the proper sizes for the proper bins. After the material has been carried to the top of the plant by the belt-conveyors, the other movements, including the loading of the cars, are accomplished by means of gravity.

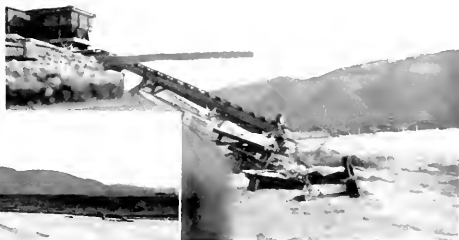
There are two crushers to handle the bowlders and rocks that are too large for commercial purposes and reduce them to crushed rock of a proper size—a Symons Brothers' disc-crusher of a capacity of seventy tons per hour that handles all that will pass through a 4-inch opening, and an Allis-Chalmers gyratory crusher of a capacity of fifty tons per

hour that handles those of a larger size. Each crusher is operated by a 50-horsepower motor. The material from the two crushers is carried back by a belt-conveyor twenty-four inches wide, which is operated by a 15-horsepower motor, and dumped on the main conveyor, so that the crushed rock is mixed in with the uncrushed and the mixture makes a particularly good grade of building material. The water for washing the material is pumped from wells adjacent to the plant by means of a 1000-gallons-per-minute centrifugal pump operated by a 50-horsepower motor, and an interesting thing in connection with this pumping plant is that the water, after having been used to wash the material before it goes into the bins, is used to irrigate several orchards on land adjoining the plant. This forms an interesting example of conservation.



View of plant, showing belt-conveyor and storage bins.

Other illustrations show how Nature replenishes the supply of sand, gravel and rock by means of a flood. These pictures are interesting also as showing the new reinforced



Cable-railway wrecked.



Views of Niles River in flood. Bridge on left.

concrete bridge across the river at Niles, the materials for which were obtained from the plant referred to. This gives an idea how Nature furnishes the materials to be wrought by man into works to protect us from her ravages.

The central views in the full-page pic-

ture do not need any particular explanation. They show the point of contact between "Pacific Service" and Nature. The entire plant, with the exception of a twenty-ton, eight-wheel, steam-driven railway locomotive-crane which is used for switching cars and with the 1½-yard clam-shell bucket is also useful in loading cars from storage piles, is operated by electric power, there being motors of a total capacity of over 480-horsepower installed.



Activities of "Pacific Service" Tennis Club

Plans have been perfected for the construction and use of two first-class concrete tennis courts located at the north-east corner of Post and Powell streets. These courts will be of the regulation size for doubles and singles play.

The tennis fans of the company are indeed fortunate to secure such fine, roomy courts so centrally located adjacent to both the head office and the business district, and in view of the coming convention of the N. E. L. A. an added attraction and pleasure will be afforded our visitors.

In a hurried canvass, the names of

about forty tennis fans have been secured to support this movement. This list will undoubtedly grow as the plans progress. Construction has already started and the courts will be ready for use before Thanksgiving.

All employees of the company are extended an invitation to affiliate themselves with the "Pacific Service" Tennis Club, which will surely redound to the benefit of both themselves and "Pacific Service."

All employees interested can secure information by addressing "Pacific Service" Tennis Club.

The Efficiency of a Steam Power Plant When Operating in Parallel with the Hydro-Electric System

By EDWIN A. ROGERS, O. & M. Dept., Steam Section
(Read before "Pacific Service" Section, N. E. L. A., August, 28, 1914.)

BEFORE going into detail as to the efficiency, or, more properly speaking, the inefficiency of modern steam-electric power plants, I want to give briefly an outline of the generating system of the Pacific Gas and Electric Company, showing the part played by the steam plants.

At the present time we have operating and tied in together as one large generating unit, ten hydro-electric and four steam-electric stations. Situated as they all are in the Sierra Nevada, the hydro-electric plants are connected to the main load centers—such as San Francisco, Oakland, Sacramento and San Jose—with transmission lines many miles in length, which are susceptible to some disorders, the main trouble being due to weather conditions. Lightning and wind sometimes cause interruptions to service over these lines and not infrequently serious damage has been done by large birds flying against the wires and putting a short on the system which has taken some time to locate and repair. Consequently it has been found necessary, in line with the company's policy of continuous service, to build steam power plants in the large load centers, each plant being capable of carrying all the connected load in the district which it is meant to supply.

Thus we have in San Francisco Station "A" with three steam turbines having a capacity of 42,000 kilowatts; in Oakland Station "C" with two turbines having a capacity of 21,000 kilowatts, and in Sacramento Station "B" with one 5,000-kilowatt unit. San Jose has a steam plant, the generators of which are engine-



E. A. Rogers

driven, but the plant is only run in extreme emergency cases, as Station "A" can under most circumstances help out on the whole peninsula. Ordinarily the turbo-generators are connected in parallel with the transmission line, and then if the line goes out of service the turbines automatically pick up the load.

This method of operating, with the steam plant as the standby, decreases the efficiency of the plant to quite a considerable extent.

In speaking at first of the inefficiency of the steam station, I did so only from the standpoint which a casual observer of the over-all record would take, provided he was not familiar with the losses encountered. Our turbine plant of today is really a very highly efficient unit when operated at a uniform load factor.

Taking first the cycle of operation, we start with the boiler. Here, by means of suitable furnaces and burners, crude oil is used as the fuel to generate the steam which passes from each boiler into a large header pipe, from which header it is led to the turbines. Here it passes through the various nozzles and blades, until, after a large part of the available energy has been extracted, it is exhausted on to the condenser tubes and condensed, then again in the form of water is taken away from the condenser by pumps and delivered to a tank known as the hot well. As it takes steam to operate some of the auxiliary pumps and to atomize the fuel oil in the furnaces, part of our original amount of water has been lost by this time, so in the hot well fresh water is added from the outside

mains to make up this loss. From the hot well the water is taken by the feed pumps and passed through heaters, which raise its temperature nearly to the boiling point before it finally enters the boiler to be again converted into steam and start around the cycle once more. The steam exhausted from the auxiliary pumps is passed into the feed heaters, furnishing the heat necessary to increase the temperature of the feed water as mentioned above.

Now, to account for our loss in this cycle of operation we will start with our fuel oil as it enters the plant. As heat is the medium by which all the work is done we will let 100 per cent represent the heat in a certain quantity of fuel oil, and following this quantity of heat through our plant cycle see what happens to it on the way. As the oil must be in practically a gaseous state in order to burn properly, it has to be broken up or atomized as it is sprayed into the furnace. To accomplish this atomizing a burner having two horizontal slots, one above the other, is used and the oil is sprayed from the upper slot down on to a jet of steam coming from the lower one. Here we have our first loss of energy, for all the steam used for atomizing goes through the boiler and out the stack with the products of combustion of the oil, doing no further work. In order to have sufficient draft to carry the burned gases away from the boiler it is essential that the temperature of these gases be very high when they are discharged to the stack, and here we have our second and most serious source of lost energy in the boiler. This loss of energy in our flue gases (the average temperature of which is about 500° F. in good practice) may be divided up about as follows:

First.—All fuel contains a certain amount of moisture and this moisture must be heated from the temperature of the fuel to 212°, at which point it is vaporized, and then superheated to the temperature of the flue gases.

Second.—Oil contains quite a large per cent of hydrogen, which burns and forms water; this also having to be superheated to the temperature of the flue gas.

Third.—The dry products of combustion must be heated to the temperature of the flue gas.

Fourth.—It sometimes happens that, due to an insufficient air supply in some part of the furnace, some of the carbon is only partly consumed and the product is carbon monoxide instead of carbon dioxide, this carbon monoxide passing out of the stack and giving us another loss.

Coming to our third and last main division of boiler losses we find that quite a lot of our heat is lost by radiation from the brick settings and exposed parts of the boiler. This latter item is the most physically apparent of all, as a visit to any plant having boilers in operation will prove.

Summing up now on our boiler efficiency with average figures taken from plants considered modern and well operated we have:

Loss due to steam for atomizing	3 per cent
Amount carried away under head of stack losses	15 per cent
Amount lost by radiation	3 per cent
Total lost in boiler	21 per cent

Of course, this item may be higher or lower, depending upon the type of boiler, the age and condition of the setting, but more directly on the care with which it is operated. Until recently the standard setting for boilers was of red brick, with a fire-brick lining capable of withstanding the heat of the fires. Lately, however, a steel shell has been tried, this shell being put on outside of the standard brick walls with a layer of asbestos between. It has been found that this asbestos and steel shell not only increases the efficiency by decreasing the radiation loss but also by reducing to an almost negligible point the air leakage through the setting. This air leakage becomes an important factor when a brick

setting gets old and starts to crack, for the cold air entering through the cracks chills the boiler and flue gases, thereby reducing the efficiency.

When one looks at the first cost of such a steel shell, it appears rather high. For example, a large boiler costing in the neighborhood of \$25,000 would require a shell costing about \$2500. When we figure, however, that if this boiler operates at rating for 70 per cent of the time and that the shell means a saving of about 2½ per cent, with fuel oil at its present price, the shell would pay for itself in two and one-half years, which is good interest on the investment.

The care in operating cannot be too strongly emphasized, and the most important item here is the amount of air which is allowed to enter the furnace for supplying oxygen to the fires. Ordinarily about 20 per cent more than the theoretically correct amount of air is used. If, however, this excess is allowed to increase to 50 per cent our boiler efficiency is lowered about 2 per cent.

Coming again to our little quantity of energy with which we started out we find that 21 per cent of our 100 has been lost in the boiler and 79 per cent given up to the water, which is now in the form of steam and on its way to the turbine and auxiliary pumps and engines. Under this latter head comes the pumps for supplying water to the boilers, for taking the water from the condensers, vacuum pumps, exciter engines, etc. A great deal of the heat in the steam used by these pumps can be saved by using the exhaust in feed-water heaters, but some of it is utilized in doing work, and we will place the amount lost here at 4 per cent of our original 100 and go on to the turbine with the steam entering the first stage nozzles with 75 per cent of our energy.

In the turbine the steam is first passed through a set of expanding nozzles from which it is projected on to a set of rotating blades, then through a set of station-

ary blades, and then another set of rotating blades, the nozzles and the three sets of blades constituting what is termed the first stage. Different machines have different numbers of stages—thus our last 15,000 k. w. unit at Station "A" has seven, the steam passing successively through all the stages and then being exhausted on to the tubes of the condenser. Now as to the turbine itself, we have a machine which has reached a very high state of perfection and one which makes use of about 60 to 70 per cent of the energy given to it which is actually *available for use*. However, only a small part of our 75 per cent of which goes into the turbine in the form of steam is available. A small amount is lost by radiation and friction of the machine but this, together with the heat loss in the generator, will be covered by 1 per cent, leaving us 74 per cent to be accounted for at the switchboard and in the condenser.

And now comes the biggest loss of heat yet encountered and one which can be reduced only to a slight extent by any means at hand at the present time. When we start to make high pressure steam, heat is added to the water, raising it from the normal temperature, which is about 60°, to the temperature at which it will boil and become steam, which is about 380° in our boilers at a pressure of 185 pounds. The heat given to the water to cause this rise in temperature is called the sensible heat, and is what we depend on to do our work. Now when the water has reached the boiling point, a still further addition of heat causes it to vaporize and become steam, and the heat thus used is called latent heat. This latent heat is only given up by the steam when it condenses, and consequently is of no value in the turbine, for very little of the steam is condensed there. A few figures then will show why so much heat is lost to the condenser. With one pound of steam at 185 pounds pressure, as used on our turbines, the total heat in it will be divided up into 355 units as sensible heat, and 843 units as latent heat. Thus only

about 30 per cent is available for use, and the other 70 per cent goes into the condenser along with that part of the 30 per cent which the turbine cannot use. Consequently, of the 74 per cent of our original heat which we had left, 60 per cent is rejected to the condenser and 14 per cent comes out of the turbine in the form of electric energy. These figures are really astonishing to one meeting them for the first time. Starting at the oil tank with \$1 worth of heat and winding up at the switchboard with 14 cents worth of it to show for our work, the rest having gone up the stack or out to the bay in the condensing water, seems a pretty poor attainment, but these are figures for an over-all efficiency of 250 kilowatts per barrel of oil, a point seldom exceeded under normal operating conditions today.

A comparison between different types

of generating stations shows the economy of steam turbines over engines for driving generators, and also shows what may some day be accomplished by way of a further increase in efficiency.

With a large steam engine plant such as Station "A," before the advent of the turbine a good over-all plant efficiency was about 9 per cent. As I have just shown, for a turbine plant this is increased to about 14 per cent. Another type of engine which has been used to a slight extent for generating, is the gas engine running on producer gas. For this type a plant efficiency of 18 per cent has been realized. Thus we have increased from 9 per cent to 18 per cent plant efficiency during the last twenty years, and at the present time there are several thousand men in the world trying to figure out ways to make a still better showing.



"MEDICINE FOR THE MIND."

Through the kindly influence of Mr. John A. Britton the "Opinions and Orders of the Railroad Commission" are installed on our shelves as they are issued from time to time. Mr. Britton, also, as regent of the University of California, has presented several interesting illustrated volumes of the Lick Observatory, viz., Vol. XI, "Milky Way and Comets," Vol. VIII, "Nebulae and Clusters," and Vol. VII, "Contributions from the University of California."

Our worthy Member of Congress, Hon. Julius Kahn, has obtained for us from the United States Government the complete bound publication of the Panama Canal Construction; this is in the form of reports and data with photographs, maps and diagrams.

The recent "Proceedings of the Ameri-

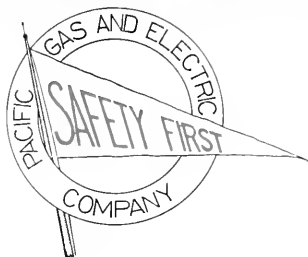
can Wood Preserver's Association" has been donated to our readers through the courtesy of that noted eastern engineer, Mr. Grant B. Shipley.

The "Electric Journal," a monthly engineering magazine issued by the Westinghouse Electric and Mfg. Co., is now on the library's file, presented by the company's local manager, Mr. C. E. Heise.

The municipal engineering departments of San Francisco, through Mr. M. M. O'Shaughnessy, the City Engineer, have promised many publications to be issued from time to time.

Mr. Mailler Searles, of the Monadnock Building, presented a large number of magazines, as did also our Mr. Geo. H. Bragg, of the O. & M. Department, and Mr. H. A. Filbert, of the Solano Department.

J. P. BALDWIN.



“Pacific Service” Campaign Now Completely Organized

THE “Safety First” campaign in “Pacific Service” is now completely organized. The Central Safety Committee has held several meetings and the reports from the district subcommittees are most encouraging, showing the greatest possible enthusiasm in all branches of our company’s system.

At a meeting held October 1st, attended by Chairman E. C. Jones, Secretary J. P. Coghlan, P. M. Downing, F. H. Varney, S. J. Lisberger and Safety Inspector Hughes, the Central Committee adopted a bulletin of a single sheet to measure $8\frac{1}{2} \times 11$ inches, which is a standard letter sheet size and the size used by nearly all of the safety associations.

It is worthy of mention here that the subcommittee of de Sabla District, consisting of Messrs. Jacob McGullin, J. R. Carl and I. B. Adams, was first in the field among the district committees with a safety bulletin, which was adopted by the Central Committee and sent out. The Central Committee has decided to issue two bulletins each calendar month and it is estimated that there will be about 225 places to post these bulletins.

The Central Committee has ordered 250 safety buttons of the design approved by Mr. Britton, and one will be furnished to each of the district committee members.

Inspector Hughes is kept busy making the rounds of the local committees. He reports having visited Oakland October 6th, San Mateo October 14th, San Jose October 16th, Santa Rosa October 23d and Petaluma October 24th. In San Jose District Manager Kuster held a meeting of his committee at a dinner given by him. In Santa Rosa and Petaluma the safety inspector accompanied the local committee in a detailed plant inspection.

Upon the recommendation of Inspector Hughes four additional subcommittees have been established, one for each of the following: The general construction department, line division, Sacramento supply district and San Francisco supply district.

The Central Committee is inviting suggestions for the improvement of working conditions and additions to safety devices. The Industrial Commission of Wisconsin has found that only thirty-three per cent of the industrial accidents are prevented by mechanically guarded machinery in dangerous places, and that the other sixty-seven per cent of accident prevention is strictly up to the personal actions of the workmen. The Central Committee calls attention to this fact and asks all employees of “Pacific Service” to do their share toward preventing accidents.

Carbon Fuel for Domestic Use

By JOHN A. BRITTON, Jr., Assistant Gas Engineer, Oakland

THE Alameda County District of "Pacific Service" has embarked on a new field of endeavor. Following along the lines of the Portland and Los Angeles gas companies, it has adopted the policy of placing on the market for domestic use "Carbon Fuel," which is simply the lampblack residual from the manufacture of oil gas, compressed into cylinders $2\frac{1}{2}$ inches in diameter by $2\frac{1}{2}$ inches long. This fuel has sprung into immediate favor, and from the present outlook it will be with some difficulty that we will be able to supply the demand this winter.

Since the year 1906, gas station "B," in Oakland, has been piling lampblack over and above the amount used for boiler fuel and the manufacture of water gas, at the rate of approximately 10 tons a day or 3,650 tons a year. No serious



J. A. Britton, Jr.

Gas Engineering Department was forcibly brought to the fact that some disposal must be made of the lampblack. Experiments had been made to see if it was possible to use it for printer's ink, but it was found to have just enough foreign

substance in it to make the ink a grayish color, so it could not be used for that purpose.

At that time Portland and Los Angeles had perfected the briquetting of lampblack and had placed it on the market in direct competition to coal, and were unable to supply the demand. An analysis of the briquettes was made by the University of California Chemistry Department, with the following result:

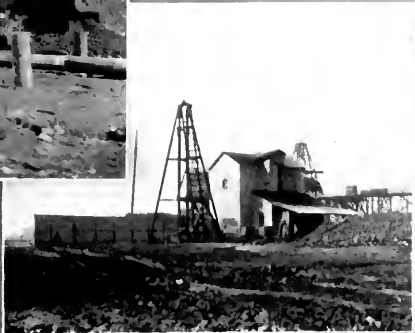
Moisture, 3.04 per cent; volatile matter, 27.32 per cent; fixed carbon, 69.06 per cent; ash, .58 per cent; heat value in B. T. U.'s per pound, 15,105.50.

This shows that the fuel which is being delivered at a price cheaper than coal has approximately 1000 more B. T. U. to the pound than the best anthracite coal. This, coupled



The raw material.

thought was ever given to the ultimate disposal of the by-product until the pile reached the alarming size of from 20,000 to 50,000 tons. Then it was that the attention of the



Carbon fuel plant.



Sacking carbon fuel for distribution.

with the fact that it has less than 1 per cent ash, while coal has in the neighborhood of 20 per cent ash, makes it an ideal fuel. Consequently, it was decided to briquette our lampblack, place it on the market under the trade name of "Carbon Fuel," and endeavor to decrease the pile and regain some of the valuable real estate it was occupying.

Two Model "D" Fernholtz four-mold lampblack briquette presses were purchased—of the same type as those in use in Portland and Los Angeles—and were installed in December, 1913. A Fernholtz disintegrator or pulverizer with a steam jacket was installed at the same time with a 30-foot bucket elevator, and a two-story galvanized iron frame building was erected over them. Approximately 1,600 feet of 20-inch gauge 12-lb. track and eight 1-yard ore cars were purchased. A 75 h. p. 440 V. 60-cycle G. E. motor was installed together with a line shaft and belting, and the plant was ready to operate. The installation was completed in March, 1914, and has been running almost continuously ever since, turning out from 20 to 30 tons of briquettes a day.

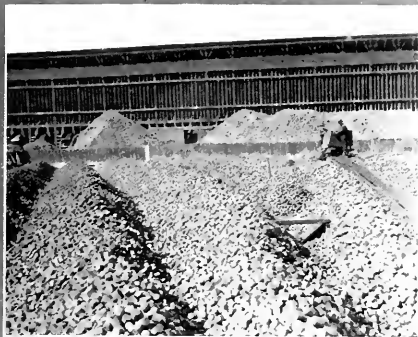
A gang of six men was put to work in the lampblack pile with picks and shovels. They pick down the lampblack and shovel it into the ore cars. From the pile it is hauled to the plant and dumped into a hopper. A bucket elevator picks it up from this hopper and

dumps it into the pulverizer, where it is ground into a fine dust. From the pulverizer the powder drops into another bucket elevator by means of which it is elevated to the second story of the building, where it runs over a galvanized screen of $\frac{3}{4}$ -inch mesh placed at an angle of 50 degrees, which separates any lumps, pieces of iron or other foreign matter that might pass through the pulverizer from the fine dust. From there it slides into two hoppers which feed the two presses. The presses automatically dump each set of briquettes into an ore car, and this car when full is hauled into the storage yard where the briquettes are dumped and allowed to season for at least 60 days. They are then ready for the market. These presses make seven revolutions per minute, turning out 23 briquettes to each revolution. Each briquette weighs approximately one-half pound, so that each press turns out 4,800 pounds every hour or about 19 tons for an 8-hour run. No binder is used in the presses, the briquettes consisting of nothing but lampblack. They are pressed together with a pressure of 750 pounds to the square inch or 3,750 pounds to the briquette, or 80,000 pounds to the press. The moulds are five inches in length, by $2\frac{1}{2}$ inches in diameter, and are filled with dust which is compressed into a cylinder $2\frac{1}{2}$ inches long.

This fall an active campaign was started in Alameda County to acquaint



Scale-house, where carbon fuel is weighed.



Section of carbon fuel yard.

the people with the new fuel, which can be used for every purpose where coal is used, and over 2,500 samples of 20 pounds each were given away. Since then the business has shown a steady increase, and



Carbon fuel, the finished product.



“Safety First”

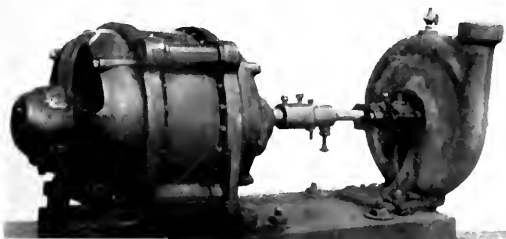
By GEORGE H. BRAGG, O. and M. Department, Hydro-Electric Section

Fortunately, for someone, the direct connected centrifugal pump, shown in the photograph, found its way back to the Sacramento Supply District.

The bolts, projecting from the coup-

ling, look innocent enough in the picture but imagine what might remain of a hand should it come within the range of one of these when revolving at a speed of eighteen hundred revolutions a minute.

The picture is shown in the interest of “Safety First,” as impressions may often be made on the minds of “guilty offenders” by giving publicity to their work. It is hoped that this may also serve to spread the “Safety Spirit” among those who so far have failed to appreciate it.



The Farm Adviser Movement

By R. E. FISHER, Commercial Department

WHAT affects the farmer and his welfare directly affects the entire commonwealth, whether it be the prospective evil of a universal eight-hour law or the benefit of an educational campaign. This applies particularly to "Pacific Service" because of its close commercial relations with the farming element in the territory covered by its operations. We of "Pacific Service," then, are particularly interested in all new movements affecting the farming industry and so it comes that we are studying the "County Farm Adviser Movement," which operates through and in conjunction with the "County Farm Bureau."

For years past the farmers have had their clubs, granges, institutes, unions and alliances, and, on the other hand, the agricultural colleges, the experiment stations and the National Department of Agriculture have been investigating the various problems of farms and farmers. To a certain extent both of these general movements have failed of their ultimate object, the farmers' associations because their activities were mostly along social lines, and the Government and universities because they failed to reach the every-day farmer with the data and information intended for him.

These agricultural institutions of the country were like an isolated hydro-electric plant, generating a product of infinite value far from the consumer designed to be reached, yet lacking the connecting transmission line to serve the consumer's wants. These transmission lines are now being established throughout this State and Nation under the name of the "County Farm Adviser."

The National Government has appropriated something over \$4,000,000 to carry on this work, and each State will spend an equal amount of its share of the national appropriation. The Government has also appointed a representative, or

leader, for each State, California being fortunate to have Prof. B. H. Crocheron, experienced, capable and enthusiastic, assigned as the head of the work in this State, with headquarters at the University of California, at Berkeley.

The method of procedure in establishing this movement is both interesting and effective; briefly, as follows:

The movement originates from the farmers in any one county, when one farmer in every five signifies a desire for a Farm Adviser by forming a County Farm Bureau, the dues being one dollar per year. Through the Farm Bureau the County Board of Supervisors appropriates the sum of two thousand dollars per year for a term of three years. The University, in co-operation with the United States Department of Agriculture, then appoints a Farm Adviser, who, it will be seen, is a direct representative of the county through the Board of Supervisors, the State University and the United States Government.

The appointee is a man trained in agriculture, usually a graduate of an agricultural college, who has had some practical experience in the broad phases of agriculture, and who should, if possible, be conversant with the particular problems that concern the locality in which he is placed. His entire time and activity are engaged there, within the boundaries of the county, where he is the practical field agent of the agricultural forces of the nation.

The duties of the Farm Adviser briefly are, to give advice on soil treatment, fertilization, crop adaptation and culture, animal husbandry and its allied phases. In general, he studies and demonstrates the various activities of the farm for the general advancement of the farmer. The Farm Adviser spends the greater portion of his time visiting the various farms where he is called for advice and con-

sultation. In order to facilitate his work and conserve his time the Farm Bureau is again called on, and at its regular meetings problems and questions of wide latitude are discussed to the benefit of all. The County Farm Adviser has an office or headquarters at some central point in the county, usually at the county seat. Here he is found on Saturday of each week, ready, efficient and capable, with a storehouse of knowledge at his command, and the eager, progressive farmer as his student and co-laborer.

The following counties have qualified and appointments made as follows:

Mr. A. H. Christiansen, Humboldt County, Eureka, Cal.

Mr. James A. Armstrong, San Diego County, San Diego, Cal.

Mr. W. Nixon, Alameda County, Cal.

Mr. N. P. Searles, Yolo County, Woodland, Cal.

Mr. Frank F. Lyons, San Joaquin County, Stockton, Cal.

Mr. H. J. Baade, Napa County, Napa, Cal.

Mr. Thos. C. Mayhew, Madera County, Madera, Cal.

Mr. W. C. Parker, Ventura County, Santa Paula, Cal.

Mr. Roland R. Mack, Kern County.

Appointments from other counties will be made in the near future.

The object of this Farm Adviser Movement is identical with ours of "Pacific Service"—*Practical, Comprehensive Service*—and should, therefore, have the hearty support of us all.

In Memoriam

CHARLES MOORE CONVERSE

On the 19th day of October, 1914, Charles Moore Converse died at his home, 2418 Cedar street, Berkeley, after a very brief illness, the cause of death being heart failure.

Charles Moore Converse was born on August 10, 1848, in the city of Delaware, in the state of Ohio. At the time of his death he was past sixty-six years of age. In 1873 he was united in marriage to Miss Carrie Little, daughter of Dr. Little of the same city. To this union there was born two daughters, Gail Little Converse and Clair Moore Converse, now residing with their mother in the home in Berkeley. In 1875 he entered the employ of the Delaware City gas works, which was owned by his grandfather. Working there some time, he was placed in charge of the works, which he managed for a number of years with credit to himself and profit to its owners. About twenty-five years ago he came to California and for a short time resided in the town of Pomona, from which place he was called by the late J. B. Crockett, who was at that time president of the San Francisco Gas and Electric Company, inviting him to take charge of the Potrero gas works in the city of San Francisco. He remained at the Potrero works for many years. He then retired for a few years but finally came back to again engage in the business in which he had so long been an earnest worker.

For the past seven years he had been connected with the collection and commercial departments of the Alameda County Division of the Pacific Gas and Electric Company. Any business entrusted to him was considered to be in good hands as it was known that he was ready at all times to do all that was possible to promote the welfare of the corporation. Nor did he forget the consumer, but with great patience and pleasing manner he used his utmost endeavors to satisfy one and all. Much of the new business and the holding of the old consumer was due to his loyalty and untiring efforts. Among his co-workers he was held in the highest estimation.

A good, true and loyal citizen, a loving and devoted husband and father has gone to rest.

Items From Women of the Company

This section of PACIFIC SERVICE MAGAZINE is open to any of our women employees who may desire to contribute notes on persons and events. The following have accepted appointment as contributing editors: Miss Letitia A. Curtis, Engineering Department, Hydro-Electric Section; Miss Margaret Dolan, Auditor's Office; Miss Bertha J. Dale, Auditing Department, San Francisco District.—Editor PACIFIC SERVICE MAGAZINE.

How about the women of the company getting interested in tennis, too?

Of course, there are many of us that do not know much about the game, but it would not be a bad idea if as many as could would learn and then we could arrange matches and, perhaps, compete for the "Pacific Service" cup next year.

The men of the company are taking a great deal of interest in tennis, as is shown by the articles appearing from time to time, in PACIFIC SERVICE MAGAZINE, and if we women would be just as enthusiastic, we might, with the proper handicap, have some exciting matches.

Tennis is a game well liked, and after the first try-out there is little doubt that anyone will stop there; so we ask all those that are interested to let us know; and if we get enough we might form a club of our own and, at the same time, help the men's club to secure a court for the exclusive use of the Pacific Gas and Electric Company.

The more the merrier, and if any of the outlying districts want to join us let them advise us, and if the club is a success visiting matches might be arranged. Get enthusiastic quickly. L. A. C.

A "hike" near home is to start out from Ingleside beach and walk down the beach, southward, and along the water's edge where the sand is hard, to Mussel Rock. Or, if a longer walk is desired, you can climb the hill to the Ocean Shore Railroad tracks which can be followed to Salada beach.

Mr. Frank Austin of the Bookkeeping Department, San Francisco District, and Miss Florence Woodhouse of the Ad-

dressograph Department, were married on September 30, 1914.

Mr. J. S. Jory, of the Auditing and Accounting Department, San Francisco District, was married on October 10th to Miss Dorothy Wosser of Sausalito. The young couple have taken up their residence in Marin county. Upon the return of Mr. Jory to the office he was presented by his associates in the department with an electric chafing dish, coffee percolator and iron.

Little Miss Marguerite Bridges, daughter of M. H. Bridges, Auditor, celebrated her first birthday on November 11, 1914. Congratulations and best wishes for many happy birthdays are extended from all members of the Auditing Department.

One of the best attended dances of the season was given by the Assembly Club, on Saturday evening, October 24, 1914, at Maple Hall. Mr. Leslie Murphy, of the Auditing Department, being a member of the club, boosted strongly for the occasion, and as a result the following employees of the company attended:

Misses Edna McNulty, Ethel Seguine, Nora Molloy, Dorothy Frazer, Margaret Dolan, Ann Davies, Florence McDonald. Messrs. Jules Mertens, Bert Crowley, Harley Smith, George Proctor, Charles DuFosse, Aloysius Gilhuly. Everyone had a most enjoyable evening.

Among the many social events which took place during the month of November was a dansant given by the members of the Sunset Dancing Club, at which many of the latest dances were featured.

DOINGS

of "PACIFIC
SERVICE" SECTION

N.E.L.A.

CHRONICLED BY ERNEST B. PRICE

Our company's section held two meetings of unusual interest during the past month. One, the regular monthly meeting, was distinguished by the presence of Dr. Ng Poon Chew, Litt. D., the Chinese journalist and statesman known throughout the country as the "Chinese Mark Twain. Dr. Ng Poon Chew delivered a scholarly address in which he traced the development of the Chinese republic from the dark days of its earliest struggles to the fall of the Manchu dynasty and pointed out the great obstacles to be overcome in establishing a republican form of government in a country where little progress has been made in educating the masses. In comparing the area of the United States with that of China, he called our attention to the fact that while this country with a population of 98,000,000 and an area of approximately 3,700,000 square miles had 250,000 miles of railroads China, on the other hand, with a population of 407,000,000 and an area of approximately 4,300,000 square miles, had only 5,000 miles of railroad. In other words, with a population of four to one and an area greater than that of the United States, China possessed only two per cent of railroad mileage as compared with our country. This lack of intercommunication, coupled with the general illiteracy and lethargy of the Chinese masses, said Dr. Ng, rendered the work of the progressive party a difficult task.

In this connection Dr. Ng Poon Chew stated that the Chinese people felt indebted to the United States for the moral support and friendly spirit of co-operation which had been expressed in tangible form by permitting the young men of China to come to this country in or-

der to view their affairs from a different angle, and that the resultant influence of American ideals and institutions had been a potent factor in the affairs of the young republic. While it was not possible to undo the work of centuries over-night, a great stride in the right direction had been made, and the cherished hope of every progressive Chinese was that some day in the near future China would be governed by representatives of the people, and take its place among the great republics of the world.

Dr. Ng Poon Chew's address was very instructive, and enthusiastically received.

The fourth meeting of the sub-section series was held on the evening of October 23d under the direction of the Auditing Department Section, whose chairman, Mr. M. H. Bridges, our company's auditor, read a most interesting paper, revealing the important part his department plays in the "Pacific Service" system. His paper covered the science of accounting from its primitive beginnings to the highly specialized systems of modern accounting which are required for great corporations like ours, not only for our own organization but, also, to meet the demands of controlling bodies such as the State Railroad Commission.

Lantern slides were used to illustrate the various financial operations described, and Mr. Bridges presented a very interesting and instructive analysis of a condensed balance sheet, taking up each subdivision of assets and liabilities and explaining the reasons for the entries under various heads. The paper elicited an animated discussion. The session was all the more attractive from the fact that it brought out a subject concerning which the general knowledge is very limited.

Baseball Extra! Opposing Armies About to Take the Field! Terrific Slaughter Imminent!

IN ORDER to assist a former member of the Auditing Department who has been ill for some time, a benefit baseball game is to be held Saturday, November 21st, at which a large and enthusiastic attendance is expected. The Auditing Department's challenge to the Vice-President's office and Purchasing Department is as follows:

Mr. K. I. Dazey,
San Francisco.

Dear Sir:—Understanding that you are commander-in-chief of the baseball army composed of the landstrum and landwehr of the allied forces of the Purchasing Department and Second Vice-President's office and that, in consequence of certain victories gained by your forces in recent engagements, you have become inflicted with an inflation of the cranium, I, as field marshal of the army of the Auditing Department, composed of the first and second reserves, hereby challenge you to mortal combat to be decided on Saturday, November 21st, which combat is liable to change the baseball map of the world.

Realizing that the neutrality laws will have to be broken in order that we may secure a catcher, commonly called "back-stop," we are willing to allow you the services of either General Hall or General Mensing, we agreeing to take whichever of these military experts that you discard.

The lineup of our troops will be furnished you as soon as you have expressed a desire to enter into negotiations with us. It is understood, of course, that upon the commencement of hostilities all friendship shall cease.

"Dead soldiers" are to be removed from the battlefield so that they may not be used as missiles against the force of the enemy.

Trusting that your excellency will honor me with a reply to this ultimatum, I remain, with the most cordial feelings of tenderness and respect,

Yours sincerely,

A. S. JOHNSON,
Field Marshal of the Auditing
Department Baseball Army.

To which the allies' forces have replied in characteristic manner following, to-wit:

November 10, 1914.

Mr. A. S. Johnson,
Field Marshal of the
Auditing Dept. Baseball Army.

Dear Sir:—Your letter of November 7th afforded to myself and other members of the Second Vice-President's office and the Purchasing Department a great deal of satisfaction.

Without pleading guilty to your charges anent inflation of the cranium, we are quite convinced that the army of the Auditing Department will have to be satisfied with second place in the engagement to which you challenge us and which challenge is hereby accepted with great pleasure.

The terms of the engagement as set forth in your letter are entirely satisfactory and the only thing which is not settled is the object of the game. As I understand it, this is to be a benefit game for Jack Allen. Will be glad to receive your confirmation of this understanding and upon receipt of your official list of troops to be engaged in the combat, we will prepare and furnish you with a similar list of our own troops.

Respecting the proposed infraction of the neutrality laws, inasmuch as General Mensing has heretofore fought in our army, we propose to continue him and we hereby consent to the enlistment by you of General Hall.

Will be very glad indeed to discuss with you at your convenience, the necessary arrangements which will have to be made.

Sincerely yours,

K. I. DAZEY,
Commanding Officer pro tem,
of the Allied Forces.

It ought to be "some" game. The announcement has just gone forth that Vice-President and General Manager John A. Britton and Mr. Joseph D. Butler, Auditor of the San Francisco District, will officiate as umpires.

Why the Purchasing Department Feels Gay

On November 7, 1914, following a challenge received from the sales force of the General Electric Company, the Purchasing Department of the San Francisco office of the Pacific Gas and Electric Company engaged in a baseball contest with the General Electric staff. The game was replete with fun and excitement, both pitchers twirling good ball but in the main being poorly supported.

In the first inning Deutsch secured a free pass to first, pilfered second base and scored on a two-base hit by Crowley. The latter, however, was destined to die on the base as the batters following him could not come through with the necessary hits. Notwithstanding this, however, the game looked easy for the Gas Company boys. In the General Electric half of the first inning, Crosthwaite, first man up, connected with one of Crowley's benders for a home run. This was the only scoring in their half of the inning as the three succeeding batters were easy outs. No runs were scored in the first half of the second but in the last half, the Gas Company boys showed how *not* to play ball and when the base running was finally over, the score was five to one in favor of the General Electric Company. Following this in the third inning, Crowley, the first man at bat, beat out a bunt to third base and Mensing and Vallejo were both given bases on balls. This left the bases full with none out and it looked as though we had a great opportunity then and there of packing the game away in cold storage. Pitcher Rea, however, willed it otherwise and the next three men each took the required number of swings at the ball without, however, connecting.

Here both teams tightened up somewhat and there were no more scores until the first half of the fifth when Murphy was hit by the pitcher and this made the game look a little better from our standpoint, but in the last half of

the fifth the General Electric batters seemed to find Crowley's twisters to their liking, and put over two more runs, making the score seven to two. In the first half of the sixth, the Gas Company boys seemed to awaken to the fact that they were supposed to play ball and when the inning was over, the score stood seven all. Not satisfied with this they scored two more runs in the seventh inning. The General Electric boys retaliated by scoring a run in the eighth inning, making the count nine to eight in our favor.

Feeling, however, that it was better to win the game by a safe margin, four more runs were put over in the first half of the ninth inning, making the score thirteen to eight, and in the last half, the batters were sent back to the bench in one, two, three order.

As an incident of the game, it might be mentioned that Mahoney, while engaged in practice, permitted the ball to hit him in the eye, resulting in an urgent call for beef steak applications which brought about an unusually high price for this commodity in the city of Oakland.

Outfielder Allen Jones of the General Electric Company, in attempting to field a fast ball hit to his territory in the eighth inning, succeeded in getting his hands on the ball, but was unable to hold on to it, the ball hitting him violently in the bread basket. We sincerely trust he has since suffered no ill effects. Third baseman Crosthwaite of the General Electric Company played a rattling good game, as did also catcher Lyons. On the Gas Company team, catcher Mensing and first baseman Deutsch also played a high class of ball.

The line-up was as follows:

General Electric Co.: Crosthwaite, 3b; Lyons, c; White, 2b; Kenyone, ss; Wheeler, 1b; Jones, cf; Gearhart, rf; Thompson, lf; Rea, p.

Pacific Gas and Electric Co.: Deutsch, 1b; Crowley, p; Mensing, c; Vallejo, 3b; Murphy, cf; Swan, 2b; Dazey, rf; Purcell, ss; Hornberger, lf.

The Financial Side of "Pacific Service"

PURCHASE OF 5 PER CENT NOTES.

The following advertisement which recently appeared in leading newspapers and financial publications is informative with respect to the use the Company is making of the funds realized from the payments so far made by the subscribers to the new issue of First Preferred 6 per cent Stock:

PACIFIC GAS AND ELECTRIC COMPANY

INVITING TENDERS OF \$2,500,000 ONE YEAR 5% GOLD NOTES.

"Notice is hereby given that the Pacific Gas and Electric Company will purchase and accept delivery as of October 31, 1914, at the lowest prices offered of \$2,500,000 Par Value of its One-Year Five Per Cent Gold Notes maturing March 25, 1915, being part of an outstanding issue of \$7,000,000.

"Owners of these notes desiring to offer them for sale are invited to forward sealed tenders (marked on outside 'Tender of Pacific Gas and Electric Company Notes') to Bankers Trust Company, 16 Wall street, New York City, on or before October 27, 1914. Tenders must specify the numbers and amount par value of notes, and prices at which they are offered. The committee in charge will add accrued interest to and including October 31, 1914, amounting to \$5.00 per \$1,000 note, and prices named in tenders should therefore be exclusive of accrued interest.

"A committee consisting of representatives of *Bankers Trust Company, N. W. Halsey & Company and Harris, Forbes & Company*, acting for the undersigned, will supervise this transaction and shall have the right to accept or reject any or all bids in whole or in part and tenders must be made with this understanding.

"Payment will be made in New York funds at the office of Bankers Trust Company, New York City."

In response to this advertisement \$3,751,000 of notes were tendered and of these the committee purchased \$2,511,000 worth at prices which netted the Company about 1% as compared with the call price of the notes.

BOND REDEMPTION.

The following numbered General Mortgage Sinking Fund Thirty Year 4½% Gold Bonds of the San Francisco Gas and Electric Company aggregating \$100,000 have been drawn by lot for redemption, in accordance with the terms of the mortgage, at 105 and accrued interest to November 1, 1914.

41	407	746	1192	1490	2070	2620	2953	3370	3675
64	551	838	1194	1494	2074	2742	2956	3394	3676
149	606	909	1195	1530	2181	2744	2980	3421	3819
150	607	947	1214	1607	2400	2754	3132	3466	3876
151	609	952	1219	1637	2483	2787	3133	3469	3891
155	637	968	1248	1806	2485	2857	3134	3512	3893
171	666	971	1272	1922	2486	2919	3210	3631	3912
177	670	1075	1321	1923	2494	2920	3240	3632	3941
182	722	1077	1444	1924	2563	2921	3242	3634	3945
362	728	1078	1466	2036	2567	2928	3367	3674	3995

The bonds bearing foregoing numbers must be presented for redemption at the office of the Union Trust Company of San Francisco, San Francisco, California. Interest on these bonds ceases November 1, 1914.

EARNINGS IN SEPTEMBER.

The Company's September income account, presented below, in condensed form, shows a continuation of the satisfactory growth of business which has been characteristic of these statements since the beginning of the year. The larger business is reflected not only in increased gross revenues but, quite logically, in a parallel increase in the number of customers connected with the Company's distribution systems and also a correspondingly greater volume of sales of gas and electricity.

The total number of consumers receiving "Pacific Service" in its various forms at the close of September, 1914, was 368,498, a gain of 29,763 during the preceding twelve months. The following table shows the number of consumers in each department as of September 30, in each of the past seven years and the gain during the total period.

YEAR	GAS DEPARTMENT	ELECTRIC DEPARTMENT	WATER DEPARTMENT	STEAM SALES DEPARTMENT	TOTAL
1907	116,289	51,135	5,494	.....	172,938
1908	127,345	59,033	5,745	.....	192,123
1909	135,120	67,037	6,326	.....	208,483
1910	147,388	79,936	6,676	.....	234,000
1911	161,251	95,514	7,208	34	264,007
1912	190,458	112,079	7,893	185	310,615
1913	203,588	126,554	8,341	252	338,735
1914	216,016	143,134	9,035	313	368,498
Gain in 7 years.	99,727	91,979	3,541	313	195,560

The volume of sales in the gas and electric departments during the first nine months of the current fiscal year to September 30th, compared with the corresponding period of the preceding year were as follows:

DEPARTMENT	1ST NINE MONTHS THIS YEAR	1ST NINE MONTHS LAST YEAR	INCREASE
Gas (Cu. Ft.).....	5,658,951,000	5,472,900,800	186,050,200
Electricity (Kw. Hrs.).....	325,399,012	292,151,525	32,947,487

That the Company is now receiving the benefit, both in increased business and in economies of operation, from the many millions of dollars expended during the past two or three years in new hydro-electric developments on the South Yuba river and improvements, additions and betterments over the system generally is clearly indicated by the following condensed income account statement:

MONTH OF SEPTEMBER, 1914.

		Inc. over Sept., 1913
Gross Revenue, Electrical Department	\$ 742,484	\$ 44,266
Gross Revenue, Gas Department	562,426	47,933
Gross Revenue, other Departments	116,724	2,498
Miscellaneous Income	22,759	(Dec.) 9,541
Total Gross Revenue	\$ 1,444,393	\$ 85,156
Net Revenue	712,814	119,468

NINE MONTHS TO SEPTEMBER 30, 1914.

		Inc. over same Period Last Year
Gross Revenue, Electrical Department	\$ 6,426,582	\$400,919
Gross Revenue, Gas Department	5,196,803	423,092
Gross Revenue, other Departments	886,916	51,386
Miscellaneous Income	220,110	(Dec.) 11,728
Total Gross Revenue	\$12,730,411	\$ 864,569
Net Revenue	6,131,328	1,222,141

TWELVE MONTHS TO SEPTEMBER 30, 1914.

		Inc. over 12 Months Ended Sept. 30, 1913
Gross Revenue, all sources	\$17,066,997	\$1,311,370
Net Revenue	8,093,272	1,639,849

DIVIDEND DECLARATIONS.

At a meeting held on October 31, 1914, the Board of Directors of the Company declared the initial dividend on the Company's new issue of First Preferred Cumulative Stock. This dividend, which is at the rate of \$1.50 per share, covers the quarter ended October 31, 1914, and will be paid on November 16th.

At the same meeting, quarterly dividend No. 35 of \$1.50 per share was also declared upon the junior preferred stock of the Company for the quarter ended October 31, 1914, likewise payable on November 16, 1914.

The transfer books of the Company will not be closed for either issue. Checks for the dividends will be mailed.

Pacific Service Magazine

PUBLISHED IN THE INTERESTS OF ALL EMPLOYEES OF
THE PACIFIC GAS AND ELECTRIC COMPANY

JOHN A. BRITTON - - - - EDITOR-IN-CHIEF
FREDERICK S. MYRTLE - - - MANAGING EDITOR
A. F. HOCKENBEAUMER - - - BUSINESS MANAGER

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Published by the
PACIFIC GAS AND ELECTRIC COMPANY
at 115 Sutter Street, San Francisco

The Pacific Gas and Electric Company desires to serve its patrons in the best possible manner. Any consumer not satisfied with his service will confer a favor upon the management by taking the matter up with the district office.

VOL. VI. NOVEMBER, 1914. No. 6

EDITORIAL

That a majority of the people of California have not joined the ranks of the calamity howlers in these parlous times was evidenced at the recent State election, when the various bond propositions submitted to the will of the electors carried by a substantial vote. The following new items were added to the list of State indebtedness:

For State buildings at Sacramento.....	\$3,000,000
For building on State Fair grounds.....	750,000
For State building in San Francisco.....	1,000,000
For State building in Los Angeles.....	1,250,000
For buildings at the State University.....	1,800,000

Total for various building purposes..... \$7,800,000

In addition, the people of the State authorized an indebtedness of \$10,000,000 for the improvement of San Francisco's harbor front. Altogether, then, the sum of \$17,800,000 was voted in State bonds. Quite a tidy sum at any time and worthy of special attention at a time when our Eastern friends are talking all manner of scareful things.

Surely, we of California are optimists in every sense of the word. Optimism seems to be in the air, and we breathe it waking and sleeping.

We are on the eve of a fair and open trial of our worth. In just three months the gates of our great International Exposition will swing open to the public. We have been preparing for this for some time, of course, but it has been

a task of great proportions, and when all Europe burst into flame last summer there were not wanting suggestions for a postponement of the opening of our Exposition to await more propitious times. The only reply made to these, however, was contained in a message from President Moore: "Tell the world that the Panama-Pacific International Exposition will open without fail on February 20, 1915." There was never any doubt upon the point. The optimism that surmounts all obstacles in the path of success settled the question once and for all.

And open our Fair will be on schedule time. And it may be that the enterprise of those who made the Exposition possible will be rewarded beyond expectation. It is not to be believed that the European war will have such an effect upon conditions out West as the pessimists would have us believe. Wise heads see great opportunities for the Pacific Coast in the very near future, and it is generally agreed that even if the lamentable conditions abroad should keep foreign visitors away those same conditions will serve to turn the eyes of all America toward California. John Barrett, the energetic director-general of the Pan-American Union, is quoted in an opinion that the Exposition will gain enormously in attendance by the unsettled condition of affairs in Europe. He points not only to the rich Americans who usually spend most of their time on the other side of the Atlantic but to the large army of our people who spend their vacations abroad. We quote from the San Francisco "Chronicle":

"As the closing of Europe to the tourist will not break them of the tourist habit they will be drawn by the Exposition magnet to scenes of far more glorious beauty than are to be found in any other part of the world. This war has done a lot toward convincing the wandering American that he belongs to a nation with a far better form of government than he may have believed, and if

it forces him to see more of his own country he will become convinced that he belongs to a land the first of all in scenic grandeur.

Our Mr. E. C. Jones has been honored with the presidency of the American Gas Institute. His election was announced at the annual convention of the Institute held in New York last month.

"Pacific Service" congratulates Mr. Jones upon this well merited distinction. It comes to him as the crowning glory of a life's career of tireless industry concentrated upon one purpose, the development and expansion of the gas industry. In this he has accomplished much, particularly in the direction of oil-gas manufacture, and in his specialty he is world-famous.

He is also president of the Pacific Coast Gas Association, having been elected to this office at the recent convention of the Association at Long Beach. In this dual capacity, therefore, Mr. Jones will find himself a busy man next year, for upon his shoulders will fall the task not only of entertaining the gas men of the country, east and west, but, also, of the world, for it is proposed to hold in our Exposition city of San Francisco in 1915 an International Gas Congress which promises to be something on a scale not before attempted in this section of the globe. Fortunately for the success of this and other ventures in his line, our Mr. Jones is an optimist. He is an optimist in other things besides the gas business, and only last month in New York his voice was heard in protest against the pessimistic views that many of his confreres appeared to hold concerning present conditions and prospects for the future. At the annual dinner of the American Gas Institute the newly elected president closed the speaking with a characteristic message in which he said:

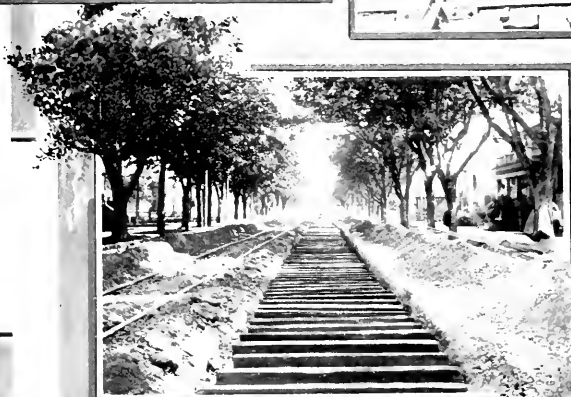
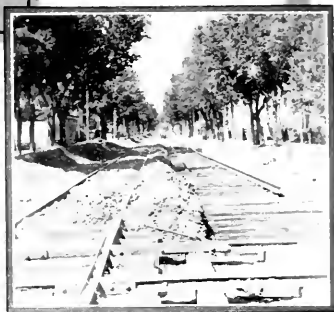
"Out in our Golden State we have learned that it is always best to look at the bright side of things. I believe that

most of your troubles are imaginary. On our trip across the country we saw every evidence of prosperity. If you don't look out prosperity will roll over you." Then he wound up with a cordial invitation to all the gas men to come West and enjoy our true California hospitality.

Wednesday, October 21st, this year, commemorated the thirty-fifth anniversary of the invention of the electric incandescent lamp by Thomas A. Edison. This day in 1879 may be said, broadly speaking, to mark the birth of electric lighting. Certainly it marked the birth of the general and popular use of electric lamps. Arc lamps had been in use some years previous to this time; but only a few of these were then employed for searchlights, to light theaters, parks, street corners and similar public places. The universal lighting of public buildings of all kinds as well as private dwellings by electricity through small units became a dream realized only when Edison first successfully made his electric filament bulb glow in his laboratory at Menlo Park, N. J., thirty-five years ago.

So great have been the benefits to mankind from the general employment of electric illumination that Edison may well be acclaimed not only one of the world's most wonderful inventors but also one of its greatest humanitarians. It is, therefore, an entirely fitting tribute to the genius of the man that the Twenty-first of October in each year should be celebrated both by the industrial world and the general public as a national anniversary. It is particularly appropriate that this day, which is known as "Edison Day," should be observed at this time in this country as a signal example of the triumph of peaceful constructive achievement in contrast with the present colossal destructive movements against civilization and her pursuits in the Old World.

"Pacific Service" joins with the rest of the world of progress in honoring the name of Thomas A. Edison.



Double-tracking Tenth street, Sacramento, from Q to Y. A "Pacific Service" job.

Tidings From Territorial Districts

Sacramento District

Double-Tracking Tenth Street

Standing on the corner of Tenth and Q streets, looking south to the City Cemetery, the average citizen of Sacramento will notice a double track with an ordinary electric car passing every ten minutes. He will probably never give it another thought. To the men who have charge of the up-keep of this property, however, it brings recollections in plenty.

One's first recollection is of the R street levee tunneled to permit a horsecar to run under the Southern Pacific track to the cemetery. The public failing to avail itself of the convenience there presented, the tracks were torn up and the cars stored in the barns. Next came an omnibus line from what was then known as the State House, at Tenth and K streets, to the City Cemetery. This also had to be abandoned after some years of unsuccessful trial. In 1890 and 1891 electricity took the place of the horse and mule as motive power, and a track was laid over a six per cent grade across the Southern Pacific tracks, the old tunnel used by the horse cars having been filled in and traffic sent over instead of under the railway. This track was built with 7-foot ties and 35-pound "T" rails, and cars ran on a 15-minute headway by means of two single-track, 7 ton cars with a seating capacity of twenty-eight persons, running from the depot along Second street to K street to Tenth street to the cemetery and return. Then in due course, the R street levee was removed and the 35-pound rails were replaced with 60-pound rails, with a grade crossing over the Southern Pacific right-of-way.

In 1905, the Tenth street line was extended south on the Riverside road 8920 feet and three double-track, 13½-ton cars were substituted for the smaller cars. Again, in 1908, an extension of 1020 feet south on the Riverside road was made in order to accommodate traffic as far south as practicable, and in 1910 the route was changed from via W street south to Y street south, to better serve the ball-grounds which had located a short time previous at the southeast corner of Y street and the Riverside road. During the ball games traffic was such that it warranted more frequent service. This was taken care of by means of a 210-foot siding between S and T streets.

Early in 1914 Mr. Britton promised the City Commissioners that he would double track Tenth street, from Q street to Y street, in twenty days after he had received permission from that body. On April 13th the work of excavation was commenced on the west side of Tenth street, in order to throw the single track then in place in the center of the street far enough to the west to allow the cars to be operated and yet not interfere with the workmen on construction of the new 87-pound, girder rail type of construction which was to be the permanent east track. This track was laid and connected at Q and at Y streets on Saturday, April 25th, at 6:00 p. m., and on Sunday, April 26th, cars were run over both tracks for that day. On the 27th work was commenced on the west side of the street and the original track removed and the 87-pound construction installed. On May 2d both ends of the west track were connected and on the morning of the 3d, twenty days after commencement, cars were run on the double track.

During the entire work of construction traffic of no kind was interrupted, as one side of the street was kept clear for vehicles and one track for cars. The entire work was completed and the street returned to its former condition on May 13th, just thirty days from time of commencement. During the reconstruction there were engaged in the work an average of 95 men daily, 12 teams, the bonding car, a traction engine hauling the plow and a 15-ton roller to complete the street surface.

N. J. HULLIN,

Supt. Sacramento Street Railway System.

Yolo District

The 3,000 h. p. plant of Reclamation District No. 108 was started recently to pump the water off of the lower part of the district. The plant was operated for about a week. When the five pumps were running, the Sacramento river at Knights Landing rose a foot. This plant has a capacity of 21,000,000 gallons per hour or 501,000,000 gallons per day, or over ten times the quantity of water used by a city of the size of San Francisco in a day. This capacity is based on about a 20-foot head.

The five discharge pipes leading to the river, from the above plant are about 5

feet in diameter, and recently we made very good use of one of them to replace a small water pipe which connects from the river to the small pumps in the plant for transformer cooling water. The broken pipe was buried under about 20 feet of sand and, in order to avoid digging up the old pipe, a new pipe was placed in one of the large discharge tubes and connected up at both ends independent of the large pipe in which it was placed.

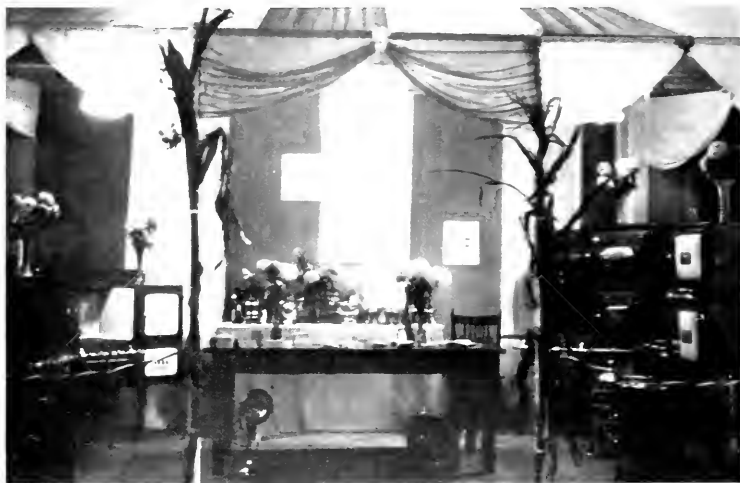
In order to give clearance for dredgers working on a drainage canal, which is being dug for Knights Landing Ridge Drainage District, the District No. 108 line was raised at a point near Knights Landing. The two poles used were each

First Annual Harvest Festival

From 2,500 to 3,000 Yolo county people visited the exhibits of the Harvest Festival held in Woodland October 30th.

The Yolo County Farm Bureau had charge of the festival and had exhibitors from all parts of the county. In addition, they had arranged a very interesting program of papers of interest to the farmers, good music and several talks by noted men of the state. The ladies served an old time farm lunch, and during the noon hour the hall looked like the old country picnic ground.

"Pacific Service" was represented by a very pretty booth, which was well filled with a good display of both gas and elec-



The "Pacific Service" booth at the Woodland Festival.

140 feet above the ground. This is about a record height for poles used on line work.

Two miles of 11 k. v. line have been built from a point near Knights Landing to the new plant of the Sutter Basin Company. The power is being used for construction purposes.

Woodland has been noted as one of the champions of temperance; for, at the election held some three years past the people voted the saloons out, that is to say, the sale of liquor by retail was prohibited but liquor could be sold in case lots and the brewery was permitted to make and sell beer by the keg. At the recent state election, however, Woodland went "wet" by three majority.

tric appliances. A great deal of interest was shown by the out-of-town visitors. Most of them are now using electric power for irrigation and want to use it for cooking and heating as well.

The number and variety of the farm products shown is evidence of the advantages of irrigation and goes to show that "Pacific Service" is one of the necessities of the modern farm.

Marin District

On August 29th we opened our demonstration of electric ranges and water heaters at our Mill Valley office with Mrs. Withers as chief demonstrator, and while

we did not expect immediate attention, the interest shown by our consumers was more than we expected.

All sorts of things were cooked, broiled, boiled, baked and fried in a way that made the most skeptical nod with approval. The water heater was also connected to a 15-gallon tank and did not lack attention. Water heating is as much of a problem in non-gas districts as cooking, hot water being in demand most any time of the day or night and generally at short notice.

After a two weeks' stay at Mill Valley, we moved to Beldere and Sausalito, staying two weeks at each place with much the same success as greeted us at Mill Valley. The appliances used were an R 2 G. E. range equipped with two top discs, three cookers and high oven, with a total connected load of 3.6 k. w., and an L-56 G. E. tank heater with a maximum demand of 2 k. w. Booklets on every kind of electrical appliance were distributed and several small orders for these were taken. Although these appliances were subject to hard usage by being disconnected, connected and hauled around, both were working perfectly at the conclusion of our demonstration.

The advertising end was not neglected. Announcements were sent out with the bills, posters placed in conspicuous places, while the nickelodeons ran a set of slides.

While the sales during the demonstration did not mount high, from the enthusiasm shown and inquiries received we feel that electric ranges and water heaters have been placed on a firm footing in Marin county and having proven practical to the satisfaction of our consumers. We expect a great many sales in the near future in non-gas districts.

HARRY L. ECKENROTH.

Santa Rosa District

From October 15th to 18th, inclusive, the California Development Board held a large and enthusiastic convention in Santa Rosa. It was very largely attended by California boosters from all over the state.

Our Mr. John A. Britton was one of the principal speakers at the session on Friday, the 16th. His remarks were listened to most attentively and caused considerable discussion on the streets subsequently. On the night of the 16th there was a large mixed gathering of gentlemen and ladies surrounding the banquet boards which were laid in the corridors and rotunda of our court house. Speeches were made by many eminent men, among them being Superior Judge Emmel Seawell and District Attorney Lea

of our own county, Robert Newton Lynch of the San Francisco Chamber of Commerce, Gavin McNab and Chester Rowell. Mr. McNab took up arms in favor of little Belgium and advocated asking these war-stricken, homeless people to come to California. This, I note from the San Francisco papers, is crystallizing into a strong movement by the California Development Board.

On Sunday the visitors were taken in automobiles over the State highway through the beautiful Santa Rosa and Russian river valleys to Asti, where they were cordially entertained by Chevalier Andrea Sbarboro, partaking of the many good things to eat and drinking the excellent wines, not forgetting the noted California champagne. Most of them took their way homeward over the noon train Sunday.

On October 22d the golden spike was driven on the extension of the Northwestern Pacific, connecting Eureka by rail with the Bay counties and San Francisco. There was a large excursion to Eureka, where an enthusiastic reception was accorded all visitors. We of the northwest territory believe that this railroad connection is a stepping-stone to great prosperity and that we will be on a transcontinental line which for beauty of scenery and diversity of products cannot be beaten in the world. We believe that this means much to the Santa Rosa, Petaluma and San Rafael districts.

One of Sonoma's best known and best loved women, Mrs. John H. Baillache, passed away in Healdsburg on Sunday, the 25th instant. Mrs. Baillache was one of the descendants of a historical family of California, being a niece of General Vallejo. She was born, as I understand, at Sonoma, and in 1846 witnessed the raising of the Bear flag at that place. She was the daughter of the Fitches, who, at one time, owned all of the territory in and around Healdsburg, known as the Sotoyome Rancho. She was the mother of a large family, all of whom were very highly talented as musicians. Above all she was the best of mothers and a woman of magnificent character.

Our most recent marriage is that of Mr. Earl Howison Cheyney, one of our substitution operators at Sebastopol, son of Mr. O. I. Cheyney, to Miss Camilla Williamson, daughter of Prof. and Mrs. James E. Williamson of Sebastopol. Prof. Williamson is a prominent educator, being the principal of the Anny Union High School of Sebastopol. His daughter is a charming young lady, of no mean talent as a violinist. Everyone wishes these young people much happiness and prosperity.

Marysville District

Not for many years have so many or such extensive improvements been under way, and so much building in progress, as at the present time in Marysville. Many new bungalows are in process of construction, and improvements contemplated in the business district. Two of our largest laundries have lately discarded their steam plants and are now using our power.

Yuba and Sutter counties will be well represented at the Panama-Pacific International Exposition next year, and everything of any importance pertaining to the products and resources of the two counties will be displayed at the big show. This exhibit will show a perfect model of one of the latest pattern \$200,000 gold dredgers as now used on the Yuba river. Also dairy products, honey, dried and canned fruits, olives and olive oil, hops, nuts, citrus fruits, figs, seedless raisins, beans, cereals, sugar beets, rice, etc.

Thousands of acres of land will be open to farm, orchard and vineyard cultivation with the completion of the greatest reclamation project ever undertaken in Sutter county. It is known as District 1001, and when completed will represent an outlay of over \$1,000,000, most of which has been paid in cash by land-owners of the district. Engineers in charge of the work hope to have it finished by next spring, and the levees high enough to protect the land during the coming rainy season. "Pacific Service" will supply this district with power very shortly.

The foundation work on Butte slough bridge is nearly completed, according to the contractors in charge of the work, who hope to have it finished before the first rains start and the work well under way before the river rises.

The Bank of Western Placer, Lincoln's second financial institution, has been opened for business in a handsome new structure. It is possible that Lincoln may have a citrus fruit exchange with the object of shipping oranges in carload lots direct to Eastern points.

Near Gridley the chances are favorable that the rice growers will now have an opportunity to harvest the greater part of their crop.

The construction of the new D street bridge has commenced over the Yuba river, and it is to be hoped that the weather will permit of work being carried on all of this winter.

J. E. POINGDESTRE,
District Manager.

Colgate District

The accompanying photograph may be of interest to readers of PACIFIC SERVICE MAGAZINE. This apparent freak of nature was discovered at Colgate by Operator



I. F. Miller, and is a young lizard, measuring about seven inches in length. Whether two-tailed lizards are of frequent occurrence in nature we cannot say, but no one in this section has ever seen one before. Should it prove to be a curiosity worthy of scientific research, we have the original nicely pickled in spirits and would gladly part with it in the interest of lizardology. After looking at the photograph, some of the "Doubting

Thomases" have asked to see the original to be sure it was not merely another modern graft scheme.

The boarding-house at Colgate, historically known as the "Martin House," is being thoroughly renovated and repaired. When completed, the Martin House will rank second to none amongst the company's dwelling houses in appearance and coziness.

Alameda County District

The regular monthly meeting of our "Pacific Service" Club was held October 15th at Lorin Hall, acting chairman E. C. Johnson presiding. Mr. J. H. Godbold of the Steam Distribution Department gave a very interesting talk on steam as used for the heating of buildings. He showed the difficulties that were encountered in providing suitable insulation to conserve the heat and prevent radiation. He handled the subject in a very happy mood and simplified many technical terms.

W. Burwell of Berkeley entertained with a number of comical stories, and other members volunteered.

Mr. E. G. McCann of the Electric Distribution Department gave a talk on motors and dynamos before a class of the Berkeley High School. "Pacific Service" is assisting in educational work. Hardly a week passes but a class or two from local schools are taken through our works. The interest seems to be so general in these subjects that, later on, arrangements will probably be made whereby the public will be given an opportunity to go through our plants under the guidance of a trained lecturer.



Jim Gallagher's great prize.

And Jim Got It

Word was passed to Jim that there was trouble on the high line in Redwood Canyon. There is only one Jim—Jim Gallagher. Jim was brought up in the school that "orders is orders," hence the word trouble landed him in his car and the next move the gas was wide open. There is only one thing to limit Jim on speed and that is the last notch on the throttle. He was there, both hand and foot. Sometimes brakes are not needed; this was one of those sometimes. While the fire department would be counting the strokes of the gong and figuring out the combination to make a start, Jim was clipping off the miles. Jim can scent trouble. Just let some electric juice singe the air on a burn off! Jim will locate it quicker than the bloodhounds tracked Eliza over the ice in "Uncle Tom's Cabin." So on he sped. What matters it if the road be dark and lonely; if the way be through spooky, overhanging trees and the road full of chuck holes? A body set in motion takes a straight line; a kangaroo occasionally touches the ground so as to distinguish itself from being a bird. You are perhaps getting the impression that Jim was speeding; forget it. Jim says he does not go fast; only sometimes. It is poetical license that Paul Revere so sped the road that anxious night. Now for the story.

Suddenly the brake slapped on—Jim, keen as usual for hot stuff, had run down the scent. "Ah, ha!"—only Jim can get off that expression of final satisfaction. You can see him pulling down the tip of his hat and look with a twinkle from the corner of his eye. There it lay, a full grown wild cat that had gotten up on the pole and shorted the 60,000-volt line! The customer sits in the comforts of his home and reads by the library table in the warmth of the hearth. He little thinks of those who are braving the elements and combating the darkness of night that he may have comfort in light. It is those faithful ones such as Jim who defy the storms and hardships shooting trouble, the boys call it. But it is a noble message—the personal sacrifice for one object—"Service." Keeping the service going a far-reaching trust. There may be a life lingering in the hospital, there is a home of joy, anxiety or sorrow great complexity of a city.

Thus a ferocious wild cat brought down the line. Teddy Roosevelt could claim no greater prize in the wilds of Africa than Jim did that night. So Jim was actually caught in a wild cat scheme; we had the goods on him. The photograph shows the stock in his hand. Don't tell Mr. Hockenbeamer that there has been any wild cat in "Pacific Service"; the photograph proves it. Jim didn't get bit, because it was a dead one when he picked

it up. But Jim will tackle a live one; he has now got hold of *First Preferred*. You should see his picture—that smile—when the dividend comes round. Jim can handle hot stuff; no chestnuts about him. It will be no cat's paw either when it comes to pulling out the dividends. Notice the picture; how he is passing it out. No cat in the bag business with Jim. Jim's long suit is locating trouble on the high line.

Any fellow can scent a pole cat, but it takes Jim to scent a cat on a pole.

Mr. M. O. Briggs, of the Electric Distribution Department, entered the sacred bonds of matrimony on October 3d. His bride was Miss Mildred L. Jmon of Oakland. Said Mr. Briggs tried his best to make a quiet get-away but was outmaneuvered by four machine loads of "Pacific Service" experts and their wives, who escorted them to the depot in a manner befitting the occasion.

San Francisco District

On the evening of September 18th Mr. F. F. Barbour delivered a very interesting talk to the employees of the Collection and Bookkeeping departments, on the subject of the Panama-Pacific International Exposition, dwelling particularly upon the illuminating features, and the part that "Pacific Service" will take to make it a success.

Preceding the talk, Mr. H. Griffin, of the San Francisco Auditing Department, and Professor Baldwin rendered several banjo duets.

Some Hunter

Charlie Ubigau, in Mr. Lusk's office of the Electrical Construction Department,



Charlie Ubigau with his trophy.

accompanied Mr. and Mrs. R. J. Ca on a vacation trip to the Newton baum ranch, in Mendocino county ing July, and came back the poss of a nice pair of antlers and a stock of venison "jerkie," as a rest his prowess with a rifle and the ki of his first buck.

Mr. Cantrell reports that he also at them.

This one made "Charlie" Barrett der where he was at:

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your very truly adviser
Yamato & Co.

The following speaks for itself:

"San Francisco, Aug. 15, 1911

"Mr. John A. Britton,
Mgr. Pacific Gas & Elec. Co.
443 Sutter Street,
San Francisco, Cal.

"Dear Mr. Britton:

"In the name of the California Association of Electrical Contractors and Dealers I desire to extend to you, through you, to your fellow officers and employees of the Sacramento District our thanks for the untiring work that has been done in making our Fifth Annual Convention a success.

"Every one, from the manager down to the office boys, seemed to feel that the success of this convention depended on them.

"Mr. Holberton gave us his time sparingly and I am positive that a much closer co-operation will be felt in the future as a result of this meeting, and the excellent illustrated lecture on the development work being done by your company.

"Again thanking you, I remain,

"Yours very truly,

"W. S. HANBRIDGE,
Secretary

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CITIES AND TOWNS SUPPLIED WITH GAS, ELECTRICITY, WATER AND RAILWAY

SERVICE FURNISHED	NUMBER OF CITIES AND TOWNS SERVED BY COMPANY			TOTAL POPULATION
	DIRECTLY	INDIRECTLY	TOTAL	
Electricity.....	126	49	175	1,220,238
Gas.....	48	2	50	1,125,068
Water (Domestic).....	9	11	20	58,710
Railway.....	1	..	1	75,602

Place	Population	Place	Population	Place	Population
Alameda.....	27,000	^{1,2} Gold Run.....	100	¹ Piedmont.....	1,720
¹ Albany.....	800	^{1,2} Grass Valley.....	4,500	¹ Pike City.....	700
^{1,2} Amador City.....	200	¹ Gridley.....	1,800	¹ Pinole.....	1,500
¹ Alleghany.....	200	¹ Grimes.....	250	¹ Pittsburg.....	2,372
¹ Alviso.....	200	¹ Groveland.....	125	¹ Pleasanton.....	2,000
¹ Angel Island.....	250	¹ Guerneville.....	800	¹ Port Costa.....	600
¹ Atherton.....	250	¹ Hammonton.....	500	¹ Redwood City.....	3,200
^{1,2} Auburn.....	2,375	¹ Hayward.....	4,000	^{1,2} Richmond.....	10,000
¹ Agua Caliente.....	100	¹ Hillsborough.....	1,000	¹ Rio Vista.....	884
¹ Alvarado.....	900	¹ Hollister.....	3,000	¹ Rocklin.....	1,000
¹ Antioch.....	3,000	¹ Ignacio.....	100	^{1,2} Roseville.....	2,600
¹ Arboga.....	100	¹ Ione.....	900	¹ Rodeo.....	500
¹ Barber.....	500	¹ Irvington.....	1,000	¹ Ross.....	500
¹ Belmont.....	250	^{1,2} Jackson Gate.....	100	¹ Russell City.....	250
¹ Ben Lomond.....	800	^{1,2} Jackson.....	2,035	¹ Sacramento.....	75,602
¹ Belvedere.....	1,000	¹ Kentfield.....	250	¹ San Andreas.....	200
¹ Benicia.....	3,360	¹ Knights Landing.....	350	¹ San Anselmo.....	1,500
¹ Berkeley.....	53,000	¹ Los Gatos.....	3,000	¹ San Bruno.....	1,500
¹ Biggs.....	750	¹ Lafayette.....	100	¹ San Carlos.....	100
¹ Bolinas.....	500	¹ Live Oak.....	200	¹ San Francisco.....	530,000
¹ Brighton.....	100	¹ Livermore.....	2,250	¹ San Jose.....	37,946
¹ Broderick.....	200	¹ Los Gatos.....	3,000	¹ San Leandro.....	4,000
¹ Burlingame.....	4,300	¹ Larkspur.....	600	¹ San Lorenzo.....	100
¹ Camp Meeker.....	200	^{1,2} Lincoln.....	1,400	¹ San Mateo.....	6,500
¹ Campbell.....	600	¹ Lomita Park.....	100	¹ San Quentin.....	2,500
¹ Centerville.....	20	¹ Los Altos.....	500	¹ San Rafael.....	6,000
¹ Chico.....	13,000	¹ Loomis.....	400	¹ San Pablo.....	1,000
¹ Collinsville.....	150	¹ Madison.....	250	¹ Santa Clara.....	6,000
¹ Colma.....	3,500	¹ Madrone.....	125	¹ Santa Cruz.....	16,000
¹ Colusa.....	1,500	¹ Martinez.....	5,000	¹ Santa Rosa.....	10,500
¹ Concord.....	1,500	¹ Martell.....	1,50	¹ Schastopol.....	1,200
¹ Cement.....	1,500	¹ Marysville.....	7,000	¹ Sausalito.....	2,500
¹ Colfax.....	500	¹ Mayfield.....	1,500	¹ Sheridan.....	130
¹ Cordelia.....	150	¹ Menlo Park.....	1,500	¹ Smartsville.....	500
¹ Corte Madera.....	350	¹ Meridian.....	300	¹ South San Francisco.....	2,500
¹ Crockett.....	2,500	¹ Milbrae.....	300	¹ Stanford University.....	2,600
¹ Crow's Landing.....	375	¹ Milpitas.....	300	¹ Sonoma.....	1,200
¹ Daly City.....	250	¹ Mill Valley.....	2,500	¹ Steger.....	1,000
¹ Danville.....	250	¹ Mission San Jose.....	500	¹ Stockton.....	35,000
¹ Davis.....	750	¹ Mokelumne Hill.....	150	¹ Suisun.....	1,200
¹ Decoto.....	350	¹ Morgan Hill.....	500	¹ Sutter City.....	150
¹ Dixon.....	1,000	¹ Mountain View.....	2,500	¹ Sutter Creek.....	1,500
¹ Davenport.....	1,000	¹ Mt. Eden.....	200	¹ Sunnyvale.....	1,500
¹ Durham.....	500	¹ Maric Island.....	500	¹ Tiburon.....	400
^{1,2} Dutch Flat.....	500	¹ Napa.....	7,500	¹ Towle.....	100
¹ Duncan's Mills.....	150	¹ Nevada City.....	2,700	¹ Vacaville.....	1,200
¹ Edenvalle.....	500	¹ Newark.....	700	¹ Vallejo.....	13,600
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¹ Elmira.....	150	¹ Newman.....	1,000	¹ Walnut Creek.....	350
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¹ Emeryville.....	5,000	¹ Novato.....	250	¹ Watsonville.....	4,500
¹ Emrital.....	100	¹ Oakland.....	215,000	¹ Wheatland.....	1,400
¹ Fairfax.....	500	¹ Ocidental.....	400	¹ Winters.....	1,200
¹ Fairfield.....	834	¹ Orange Vale.....	100	¹ Woodland.....	5,500
¹ Forestville.....	100	^{1,2} Palo Alto.....	6,300	¹ Woodside.....	200
¹ Felton.....	300	¹ Pacifica.....	400	¹ Yolo.....	400
¹ Fresno.....	40,000	¹ Penryn.....	250	¹ Yuba City.....	1,200
¹ Folsom.....	1,800	¹ Patterson.....	300		
¹ Gilroy.....	2,000	¹ Penn Grove.....	300	Total.....	1,287,238
¹ Glen Ellen.....	500	¹ Petaluma.....	5,500		

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¹ Gas only.

² Gas and Electricity.

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⁴ Gas, Electricity and Street Railways

¹ Electricity and Water

² Electricity supplied through other companies

³ Gas supplied through other companies.

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4 steam-driven electric plants in big cities

17 gas works.

SERVES 1/4 of California's population

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An area of 3,275 square miles

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PACIFIC SERVICE MAGAZINE



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Vol.
6

DECEMBER • 1914

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7

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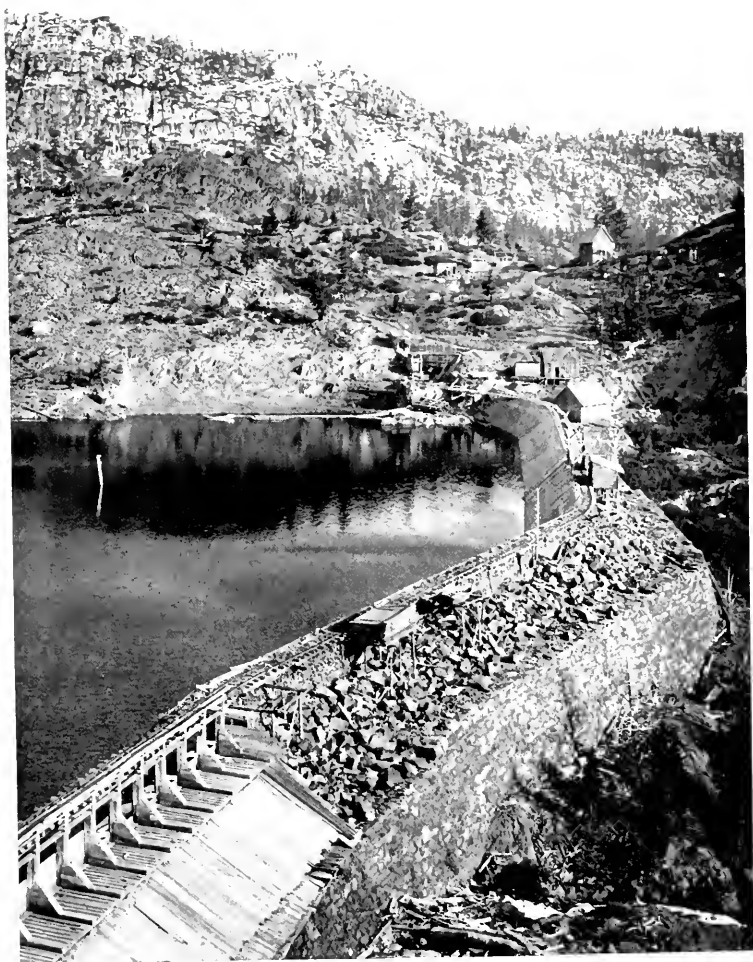
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Contents for December

LAKE FORDYCE, PARENT RESERVOIR OF THE OLD SOUTH YUBA SYSTEM	<i>Frontispiece</i>
NATURE—POEM	<i>John A. Britton . 215</i>
A VACATION STUDY OF YOSEMITE VALLEY	<i>J. P. Baloun . . 217</i>
LANDMARKS AND TYPES OF THE SPAULDING REGION—REMINISCENCES OF THE OLD SOUTH YUBA DITCH	<i>Geo. E. H. Betten . 228</i>
THE INTERNATIONAL GAS CONGRESS TO BE HELD IN SAN FRANCISCO IN 1915	<i>E. C. Jones . . . 232</i>
SPECTACULAR BASEBALL BATTLE THRILLS BEHOLDERS	<i>Walter D. Suttan . 237</i>
JAMES HUGH WISE LIBRARY	<i>238</i>
AN ENGLISH RIVAL OF THE SIR JOSEPH HOOKER OAK	<i>239</i>
"PACIFIC SERVICE" TENNIS CLUB GIVES THANKS FOR ITS NEW COURTS.	<i>R. E. Fisher . . 240</i>
WHAT 2,000,000 KILOWATT HOURS WILL DO	<i>242</i>
"PACIFIC SERVICE" WINS THE PRIZE AT THE FILLMORE STREET CARNIVAL.	<i>243</i>
THE FINANCIAL SIDE OF "PACIFIC SERVICE"	<i>A. F. H. . . . 244</i>
EDITORIAL	<i>246</i>
"PACIFIC SERVICE" AS AN AID TO NATURE IN GOLDEN GATE PARK	<i>A. L. Harris . . 248</i>
PURCHASING DEPARTMENT KEEPS BUSY	<i>250</i>
DOINGS OF "PACIFIC SERVICE" SECTION, N. E. L. A.	<i>E. B. Price . . . 251</i>

Index to Advertisers

Allis Chalmers Mfg. Co.	ii	Pierson, Boeding & Co.	vi
Associated Oil Co.	iii	Roehling's, John A., Sons Co.	v
Bonbright, William P., & Co.	i	Schaw-Butcher Co.	viii
Byron Jackson Iron Works.	vii	Sprague Meter Co.	iii
Chaplin-Fulton Mfg. Co.	vii	Standard Underground Cable Co.	vii
General Electric Co.	ix	Steiger & Kerr Stove & Foundry Co.	vi
General Gas Light Co.	ii	Wagner Electric	vii
Hulsey, N. W., & Co.	4th page cover	Western Engineering Publishing Co.	iii
Johns-Manville, H. W., Co.	v	Westinghouse Electric & Mfg. Co.	x
Pacific Telephone & Telegraph Co.	2d page cover	Welsbach Company	iv
Patriek & Co.	viii	White, J. G., Engineering Corporation	2d page cover
Pelton Water Wheel Co.	viii	Wood, H. D., & Co.	v



Lake Fordyce, the parent reservoir of the old South Yuba system. The dam was started in 1873 and completed in 1882.

See "Landmarks and Types of the Spaulding Region," page 228.

Nature

×

BY JOHN A. BRITTON

×

I know the lair of the cinnamon bear
And the pool of the wily trout ;
The hollow trees where the buzzing bees
Are humming their way in and out ;
Then away to the woods and the odor of pine,
For so fair are the glades, yes, for mine and for thine !

I love to glean in the sunshine sheen
The flowers that bloom in the shade
Of the lofty spruce, for the world is of use
To lovers, for whom it was made !
Then away to the hills, to the mountains and lakes
Where nature is God. He never forsakes.

I long to lave in the spume of the wave
As it rolls on the sandy shore ;
While, sailing by, the gull in the sky
Takes wing to the land nevermore ;
Then away to the sea with its billows of foam
To the end of the earth on its bosom I'd roam.

I wish for the days of the winning ways
Of the child with its wholesome thought,
Sweet purity ; so pure would I be—
But the way with sharp thorns is fraught ;
Then away to the past, with its laughter and tears,
Its bubbles and dreams, its desires and its fears.

I want to know, "Will the future show
The evil and good we have done?"
Dark though the way, let us hope and pray
That time does not hold while we run!
Then away to the meadows, the glen and the brook,
For communion with nature, your God, and your book!

I wish for you, the universe, too,
On our bright, gladsome Christmas tree
That gifts to be from you and from me
May be charged with loyalty!
Then away to your work and away to your play,
There is work for tomorrow, then work for today!

I know the lair of the cinnamon bear
And the pool of the wily trout;
The hollow trees where the buzzing bees
Are humming their way in and out;
Then away to the woods and the odor of pine,
For so fair are the glades, yes, for mine and for thine!

SAN FRANCISCO, CALIFORNIA.
CHRISTMAS, 1914.

A Vacation Study of Yosemite Valley

By J. P. BALOUN

THE Indian word Yosemite, meaning in English "Grizzly Bear," is anything but a descriptive title for the "Valley of God" that bears it. To us that have marveled at its grandeur, have felt the sides of its rugged cliffs, have walked its trails, have tasted the purity of its mountain streams, have caught the fascinating roar of its falling waters, have scented the fragrance of its forestry and its floral growth, it appeals as Nature's most beautiful and romantic treasure-ground.

From the moment one enters the valley, one's interest is kept at concert pitch by a succession of wonders. Truly Nature has spread herself in all her glories in this immense beauty spot of the world. To attractively describe it would be a task beyond human comprehension. Nevertheless, in giving an account of a most delightful vacation spent there one can at least pay such tribute to its glories as lies in one's power.

We enter the valley at El Portal, the terminus of the Yosemite Valley Railroad. This station is just outside the lines of the government reservation, and so, after a short stay at the hotel, we are transferred to our camping ground by auto-stage. We ride along the bank of the rushing Merced and admire it as it twists and foams on its rapid course toward the sea. On the other side we are walled in by huge granite cliffs and we feast our eyes on these in admiration mingled with awe. Soon we make a sharp turn in the road to the left and get a beautiful view of Cascade falls. To see this cataract with the afternoon sun shining upon it is something to remember. Then soon we see to our right and far above the road, first, Inspiration Point and, beyond that, Artist's Point. Each of these points of interest has its admirers and both are especially

dear to the photographer and the artist. They are natural observatories and as such are appropriately named.

One of the first gateways to the valley is a unique natural structure called Arch Rock. This is the result of several tremendous boulders of granite meeting one another so as to make an opening large enough to enable the largest horse or auto-stage to pass through with safety. Some of these boulders have fallen from a once loftier position and have made natural caves by the manner in which they lie. Meanwhile, we are still running by the side of the boisterous Merced river, and soon we cross the Pohono bridge and take a road to the right past Artist's Point. From this one views several water falls in succession; on the right, the Widows' Tears and Bridal Veil falls, each lovely in its own way, while to the left are seen the Ribbon falls, the highest in the valley and which took more like mist or steam than water. And now we come to the real gateway of the Yosemite Valley, that grand monarch among sentinels, El Capitan, guarding the entrance on the left side, and the Cathedral Rocks, with the Cathedral Spires welcoming us on the right.

Many famous landmarks are outlined in the perspective, such as the Three Brothers or Leap Frog mountains, with Eagle Peak as the highest point, the North and Basket Domes on the left and the South or Half Dome right ahead, with Clouds' Rest lying peacefully beyond. On the right, Sentinel Dome and Sentinel Rock are outlined with their vertical granite spires reaching to the skies. The El Capitan meadows with their luxuriant forest foliage for a background and the Merced river flowing peacefully through, make a picture that many an artist has endeavored to reproduce.



Views of the Yosemite. Reading from the top downward these show: 1, The gate to the valley; 2, South Dome and Clouds' Rest; 3, looking toward the valley, showing Liberty Cap, Vernal and Nevada falls; 4, the impetuous Merced river; 5, El Capitan.



Mirror lake, Mount Watkins in the background.

As we pass through this gateway, the reflections of the Cathedral Rocks and the Three Brothers are seen in the mirror-like water of the Merced. We do not get by the Three Brothers before we hear the musical sound of the Upper Yosemite falls, which, it has been said, has been heard five miles away. I have myself caught the peculiar roar of these world-famous falls at a distance of over two miles. There are many different falls in the valley, but the Upper Yosemite falls possess a fascination that wins over all of the others, to my way of thinking.

So, as we move along nearer to the village we catch a reflected view of the Yosemite falls in the Merced river. This mirror-like effect at certain periods of the day when there is not a particle of wind

is so wonderful that visitors have their attention called to it as they pass by.

Our companions of the trip up to this time have kept together, but now we are about to separate. There are private camping grounds provided by the government and there are three noted public camps, Ahwahnee, Lost Arrow and Curry, as well as the Sentinel hotel. These camps are located in the bed of the valley and within a mile of the center of the village. Thus we are delivered to our temporary places of abode which we had previously selected and after a hearty dinner we all sit around the campfire and spin yarns. We retire early to our tents, which are very neatly mounted on modern platforms, and the slight rumbling roar of the near-by Yosemite falls sings us to sleep.

The next day, I thought it best to acquire a general knowledge of the more accessible points of interest and the relation of the camp to the points of the compass. Our most enthusiastic tourists upon their arrival immedi-

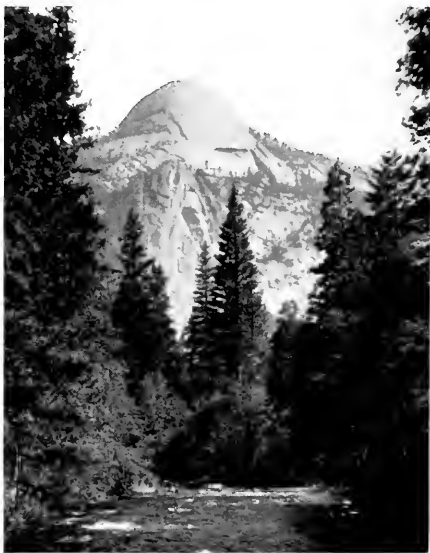
ately take up the most difficult and dangerous excursions. This is due often to ignorance, sometimes to just plain foolhardiness. The first day can very enjoyably be given to Mirror lake by way of the road past the Royal Arches, Washington Column and Indian Cave, leading to the Tenaya canyon where the lake is located. In passing the Royal Arches we note the immense concentric recesses deeply grooved in the steep precipitous cliff. This peculiar sculpture was done, no doubt, by frost action and some glacial movement. The Washington Column, which stands just to the right of the Arches, has a peculiar fortress-like effect. The Indian Cave, which is a natural opening beneath the cliff's overhead, suggests a culinary apartment of the stone

age. As it is necessary to visit Mirror lake before the sunlight dissipates the mirror-effect already spoken of, we made an early start and were well repaid for our efforts. This lake is an enlargement of Tenaya creek flowing in this canyon.

Partly retracing our steps we learned that the Happy Isles could be easily reached and so we went by the foot of that lofty peak, the Half Dome. On this road, as you near the isles, if you will but look back at North Dome through the tall pine trees, you will be repaid by a wonderful picture. On reaching the Merced river and crossing the heavy drive bridge, the government hydro-electric power station is seen on the west bank of the river. This is due to a sharp turn, as the river flows normally the same as the valley, due east and west. Both isles were visited, and as an observation bench has been provided at the upper end of the upper isle, that suggestion was taken advantage of; and in due time we made for Sierra Point, named after the club of that name that has done so much to exploit the wonders of the Yosemite. You cannot but appreciate every effort you exert in scaling this prominent height, for from the pipe railing enclosure one can view the five falls, the Illilouette, Nevada, Vernal and Upper and Lower Yosemite, besides enjoying the outlines of Liberty Cap and the cataracts on the Merced and Illilouette streams. After lunch we walked to the foot of Vernal falls and then back to camp by about four o'clock in the afternoon, completing a day's trip of about ten miles. These symmetrical falls are as methodical in their flow as the water going over the spillway of a reservoir. As we discovered later, they present a striking contrast to the impetuous, twisting Nevada falls, that seem so glad to leap from their lofty river bed to the plateau below.

Thus in one day we had paid our respects to many points of interest. We decided the following day to take one of the popular mountain trails to the foot of the Upper Yosemite falls, climb to the top and thence to Yosemite Point, a round trip distance of ten miles. All trails are most carefully constructed by the government and are as safe for foot traveling as for a pack mule. This Yosemite trail, which begins behind the military barracks, gradually winds up numerous zig-zag paths past Columbia Point and alongside the base of the Upper falls. Then, after another tedious though safe winding trail our curiosity to see Yosemite creek leap from its bed is satisfied; and it is well worth the trouble, for it is a grand sight to witness this volume of water rushing out into space and then gradually falling in a graceful curve until it reaches the sheer perpendicular drop of 1430 feet.

As Yosemite creek was reached before noon and the clouds were threatening a



North Dome from road to Happy Isles.

thunderstorm, we quickly availed ourselves of three small granite caves for our noon dining-room. We did not have long to wait, for soon the very heavens belched forth discharge after discharge of lightning, and with the deafening thunder that followed and re-echoed and reverberated through the canyons and against the cliffs made a wonderful exhibition of pyrotechnics. Tremendous flashes seemed to reach between points many miles apart and show the energy from billions of volts pressure being dissipated to Mother Earth; while the relative speed of sound and light never was so forcibly impressed in our mortal minds.

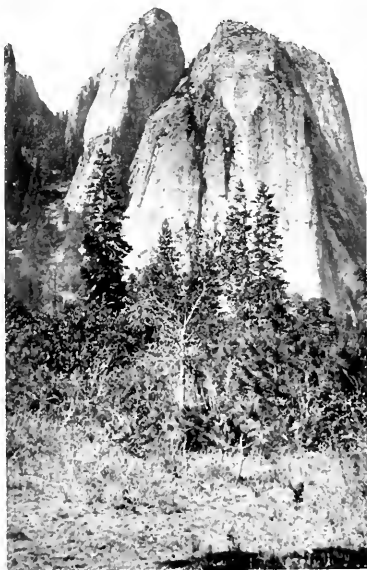
The next day I went to the Yosemite power-house to look into its engineering features. It is a galvanized iron gable roof building located on the Merced river about one-quarter of a mile below its junction with the Illilouette creek cascades. This plant is operated and maintained by the United States government, and all of the employees are on the government pay-roll. The operators are furnished cottage, fuel, water and light, so that their actual salary averages much better than in most private companies. Naturally, the night load for such a plant is lighting only. The system of road illumination at crossings and bridges is extended to the Pohono bridge. The day load is only partly illumination, being principally motor load for the government rock crusher and wood-sawing

plants. There are, also, a refrigerating plant and washing machines that are operated by electricity.

The machinery of the government power-plant consists of two 75 k. w. General Electric Company 2-phase, 2300-volt generators running at 900 r. p. m., each belt-driven by a 50-inch diameter Pelton water wheel unit. The original plant had but the one unit and it is still installed,

with no regulating needle valve or governor mechanism, but just controlled by a plain 10-inch gate valve. The second unit added by the government has an adjustable belt-tightener as well as a modern Pelton governor equipment. The 4-wire 2300-volt lines leave the station on a very neat system of line and pole construction. Outdoor transformers step down the voltage from 2300 to 112-220 volts. The two switchboard panels, installed in 1902 by Henshaw-Bulkeley & Co., are neatly arranged and are provided for metering on the high side.

The pipe line is 1300 feet long and has a pressure of 65 pounds per square inch at the 3-inch entering nozzle to the water-wheel casings. The riveted steel pipe is graduated in step diameters from an initial of 30-inch, then 20-inch, down to 10-inch nearer the power-house. The accompanying views show the supply of water in the Merced just above the dam, also the concrete dam with shut-off gate for controlling water down the pipe-line. This



Cathedral Rocks, or The Three Graces.



Views of the Yosemite. Reading from top downward, left to right, these show: 1, Confluence of the Merced and Hiloquette rivers just above the power-house dam; 2, steel pipe-line on granite bed, showing concrete anchor; 3, concrete dam and regulating gate-valve; 4, Yosemite power-house almost hidden in the trees.

line has an excellent screen over the intake pipe and grizzly arrangement ahead of that, and it has sufficient air valves, besides having substantial concrete anchors for securing the same in the small rugged canyon that guides the pipe to the power plant. The difficulty of running these two water-wheel units in parallel is somewhat of a problem, but by starting the regulated unit first and then synchronizing through the alternating current generators the control of the second water-wheel can be secured. It is, however, a bit of operation that is out of the ordinary.

Having investigated the power-house, the trip through the Le Conte Memorial Lodge, Yosemite cemetery and the Indian Village supplies sufficient interest to occupy the afternoon. The Lodge was dedicated by the Sierra Club to "all things Yosemite." Books, publications of all kinds, photographs, pressed flowers, seeds or curios are gladly given a perpetual home in this interesting memorial to the famous educator who died in the valley he so dearly loved.

The cemetery is unique in that it occupies a secluded spot lying between the Yosemite falls and the Royal Arches, as does, also, the Indian Village. The graves of the late Galen Clark and that good old pioneer, Lamon, are marked by high blocks of granite, with only their names and with no dates of the beginning or the close of their benevolent careers. The



The Three Brothers, or Leap Frog mountains.

Indian Village is not over modernized and was well worth a visit, which included the witnessing of an ancient gambling game that was accompanied by a quasi-musical, monotonous chanting. With the weird singing and waving of the hands it certainly presented a picture to our eyes, especially as the Indians all wore their serapes. Presently a young Indian mother of seventeen summers came forth with her eight-months-old papoose to greet us, and we praised the child and gave the mother a little money in her palm, which made her face beam with pleasure.

The prospect of a really long trip the next day induced us to make an early start. This was to cover the trail to the top of Union and Glacier Point and Sentinel Dome, including a short stop-over at the Glacier Point hotel. The trail commences from a point near Camp Ahwahnee, and soon we reached the inviting heights above and accepted the invitation to view the Yosemite falls from different angles. Several hours later we reached the overhanging rock more than 3200 feet above the valley. This is truly one of the "points of interest," sad as its association is with the recent fatal accident to a San Franciscan who, obliging a lady who wished to step out ahead of him, lost his footing and fell to the cruel rocks below.

In mounting my pocket compass at this point, I observed the exact relation of



Falls of the Yosemite. Upper left, Lower Yosemite falls; upper right, Vernal falls; center, Yosemite falls; lower left, Bridal Veil falls; lower right, Nevada falls.

the different prominent peaks to Glacier Point. I had fortunately availed myself of such map data as I could secure from the government publications, and so with this engineering compass I was in great demand, continually explaining the whereabouts of Mt. Watkins, Hoffman mountains, Mt. Clark, Dana, Lyell, Starr King, etc. The value of such easily procured literature is well worth the price on such a trip. It is true that it is fatiguing to carry too large a camera and tripod (which is absolutely necessary) and a compass and, often times, a lunch, but what is there in this world after all that is worth anything at all that doesn't require some exertion?

From the veranda of the hotel at Glacier Point one of the most comprehensive and completely finished views in the world can be seen. For, looking from that height over an expansive area of miles and miles of snow-capped ranges and mountain peaks, with their heavy timbered forest growth and with the Merced river, Nevada and Vernal falls set like jewels in the Little Yosemite canyon, one is really spell-bound.

The trip to Sentinel Dome was easily made, and as one passes a large number of trees the shade was welcome in the middle of the day. Just before reaching the summit a large clump of fifteen spires of the deep blood-red snow plant were seen. It is a rare flower in the valley, and the gov-

ernment imposes a fine upon anyone tampering with it. We examined it very carefully but concluded that its beauty would never surpass that of the rose in our home gardens.

The top of the Dome was covered with snow, and as a snow-man is usually in order to the city man from the coast a replica of the famous "Teddy" was decided on, and he was soon sculptured in cartoon fashion with a large broad brim hat and red bandana handkerchief, and the proverbial "big stick" in his right hand. Then, after absorbing with appreciation the magnificent vista from this 8100-foot elevation, we made tracks to take the Long Glacier trail back to camp by way of the Illilouette, Nevada and Vernal falls and Panorama cliffs.

Few travelers ever enjoyed their progress through such contrasting scenery more than we. The ever changing features of the cliffs showed the glacial action of a period probably several thousand years ago. The voluminous falls were all beautiful in the afternoon sun with their rainbow effects. The Nevada falls were particularly spectacular in this regard, the multi-colored how sweeping through their misty clouds of spray with such striking effect that the entire party of several dozen persons stood spell-bound at the sight.

There are many other interesting places to visit, an almost unlimited number of excursions of



Wind-blown pine-tree on Sentinel Dome.

one, two or three' days. The average sightseer and vacation tourist, however, has not unlimited time at his disposal. Some short and shady trails are worthy of mention. There is a path at the foot of the cliff below Glacier Point that connects Camp Curry with the Happy Isles. This road is so much shorter than the regular drive road and really not known to every one. Its beauties include two rustic bridges and glens of tropical ferns and luxuriant vegetation. Lost Arrow trail, from Camp Lost Arrow to the Lower Yosemite falls, is even more attractive. For, there are more clear, sparkling streams of water to cross, water which but a few minutes before came down from Yosemite falls and is on its way to the Merced river. This Lost Arrow trail is sometimes called the Lover's trail. The name Lost Arrow is from an Indian legend connected with the valley. There is a tall granite spire just above, and behind the Camp Lost Arrow that also bears that name, but the tale in connection with this historical name is as follows:

The Yosemite tribe of Indians at one time had a chief whose son was enamored with the daughter of the chief of the Ahwahnee tribe. The maiden possessed great beauty and accomplishments and was sought after by all the gallants of red blood from far and wide. The two chiefs, after some argument, imposed as a condition of their betrothal that the

young man should go away and kill more bear and deer than any man of either tribe. If successful, he was to announce this achievement from the top of the cliff now supposed to be Yosemite Point by shooting three arrows straight into the sky and across the valley. His enemies plotted to lie in wait for him in the canyon below; however, members of his own tribe discovered the plot in time and when the young chief appeared on the high cliff, they met the plotters in combat and overcame them. Although but two arrows were ever found the trophies exhibited satisfied both chiefs and the young man obtained his bride whom he had bravely and gallantly won.

Camping out, which is far cheaper than staying at the hotels, attracts the great majority of Californians. The government has a few fixed rules and regulations in its national forests that can be so easily complied with that no one contemplating camp life on government land will find them anything but a benefit. The government's word is law and the preservation of animal and vegetable life is supreme, so that in the valley the very butterflies and all the bird-life seem to feel and enjoy perfect freedom and protection. I cannot close this without a wish that every friend and friend's friend of mine may find an opportunity to see this wondrous valley, and confirm my pleasant experiences.



The writer in his "Sierra Apartments."

Landmarks and Types of the Spaulding Region

George E. H. Betten, company's ditch-tender at Gold Run, culls from the recesses of his memory some notes about the old South Yuba ditch, whose acquaintance he made first upwards of fifty years ago.

HEREWITH submit a few notes about the South Yuba ditch and its history in Placer County. For some of the information I am indebted to friends, but most of it comes back to me very clearly, though nearly fifty years have passed since I first heard of Captain Kidd's ditch, as it was then called ('63) when I came to Gold Run.

At that time the great gravel deposit extending from "Nary a Red" above Dutch Flat, south of Gophertown, a distance of about five or six miles, had scarcely been touched, owing, of course, to the limited water supply; this was especially true in the Gold Run district, where water could only be had when the supply exceeded the demand at Dutch Flat and vicinity; and that was not often, for the supply, at best, was meagre. Water was sold to miners according to seniority in those days, the oldest mines being served first. In '63-4 was the famous dry season of California when some of the mines got no water at all. Some of the Gold Run mines had water only twenty-six days and others got none.

Lake Fordyce, the construction of which was gotten under way about that time, then attracted the attention of the miners, especially those of Gold Run, and after much diplomacy Captain Kidd ordered a survey which, it was reported, pleased him greatly. The survey was extended to Gold Run in July, 1864, I think, and there was joy in the camp.

Construction was started shortly afterwards from the head and carried on with vigor. Nearly all the miners took contracts, agreeing to take their pay in water; among those I remember were the Messrs. Henk and Jake Abeel, above

Gold Run, and Messrs. Charles Brogan and Brooks Judd, below town and down to Gophertown. Mr. Brooks Judd was killed in his mine by a cave-in, July '65.

The season of '64-5 was a good water season; water was turned into the new Yuba ditch almost as soon as it was completed. But the town began to boom several months before that time with the usual influx of gamblers and camp followers of both sexes. The "South Yuba" carried all before it, having no reservoirs, and not wishing to waste any water the management induced the miners to use water both day and night, week days. Then, after a while, by giving half rates for Sundays, much more water was saved from wasting.

The water rates of the other ditches were fifteen cents per inch, I think, for ten hours, up to November, 1863, when a reduction of three cents was granted, water being measured through a 3-inch issue with 6-inch head from the center.

The South Yuba, however, was measured through 2-inch issues with 6-inch head above the top of the issue, and that at once became the popular method. The rate per inch was twenty cents for twenty-four hours (with a little salt) and even with these more favorable rates, the South Yuba always got the biggest share of the clean-up.

It must not be supposed, however, that all this was accomplished by the South Yuba without opposition from the other ditch companies, which had the field pretty well covered and, I was told, in some cases held mortgages on mines they had furnished water to. In a short time, however, the South Yuba got control of the sales by liberal treatment of

the miners. One company alone, the Gooseling Ravine, as Mr. Sachs, the manager, told me, paid the South Yuba over \$200,000 for water from '65 until the mine was worked out. A few years after the South Yuba reached Gold Run the water sales reached a total of \$57,000 in a single season, according to report.

After the ditch to Gold Run had been determined upon, the name of Captain Kidd became somehow disassociated with its management; for, when the survey was finished, Messrs. Charles March and James Wartenbee of Nevada City came over and let the contracts for its construction. They were accompanied by a Mr. Bean, who seemed to be their secretary, while Mr. James Holmes took charge of its construction, I think, from Dutch Flat down; and it was Holmes who came with the surveyor, Mr. Clem Uren, and some party I did not know—myself taking a hand just for the fun of it; boy that I was, and enjoyed it hugely for a while, driving stakes. After the ditch was finished, Mr. Holmes became the local manager of it, with Mr. Jerry Spurrier as ditch-tender for the Gold Run district. Mr. James Holmes about 1868 or 1869, was succeeded by Mr. Stephen Holmes, and he, after some years, by Mr. Hamilton Vance.

It was about this time, 1874 or 1875, that Mr. Alvinza Hayward of San Francisco took over the control of the South Yuba interests, at least in Placer and Nevada counties, and with him came Mr. John Spaulding, who at once became noted, not only for his successful management of the affairs of the South Yuba system as he found it, but also for his efforts toward acquiring the Bear River and Auburn ditch and its water rights. Mr. Spaulding was probably the only man

in Placer County to see its possibilities, and he at once took steps to take advantage of them. The same may be said of the Town Talk ditch and other improvements in Nevada County; also of the construction of Lake Spaulding dam, in which Mr. Spaulding was joined by his able lieutenant and co-worker, Mr. W. F. Engelbright, afterward Congressman from the First District. In the writer's opinion, the teamwork, energy, perseverance and solid tenacity of John Spaulding and W. F. Engelbright made possible the acquisition of the Cedar Creek system, the building of the Alta powerhouse and the ditch leading to it, and the installation of that great water system from Gold Run down through



George E. H. Betten, company's ditch-tender at Gold Run. His acquaintance with that locality dates from 1863.

central Placer, in which latter they were joined by Frank Godding, John Peters and R. E. Linder, at least as far as Colfax.

In 1890, when the extension of the South Yuba to Auburn was determined upon, Spaulding and Engelbright at once prepared to reconstruct the old ditch from Bear Valley to Gold Run, and by December, 1891, the work of building new flumes and strengthening the ditch reached that point, under the able management of Frank Godding, assisted by John Peters. The early spring of 1892 witnessed the starting of the survey for the new ditch by Mr. Clem Uren, while actual ditch-digging began at Gold Run July 25th, the same year, and ended with the installation of the sand tank and the upper end of the pipeline across Stampede Canyon at Serret town. Mr. John Peters had charge of that part of the ditch, assisted, for a short time, by Godding & Linder, building flume, I believe.

On February 11, 1893, Mr. Engelbright gave the writer charge of the ditch from Dutch Flat down to the pipeline, and on May 2d construction was resumed at Serret town, Godding & Linder in charge, and carried on to Long Ravine. On September 29th I took charge of the ditch to Schroeder Gap, a distance of about ten miles by the line from Dutch Flat, working under orders directly from Mr. Engelbright at the Nevada City office. The pipeline at Serret town across Stampede Ravine was finished the latter part of May the same year.

The year 1894 saw the ditch extended to Colfax and the pipeline built across Long Ravine. This was the year of the great railroad strike, and "Uncle Sam" established a deadline across Long Ravine. As no one was allowed to cross this line the work of installing the pipeline was much delayed; the work of extending the ditch, however, was carried on without interruption between Colfax and Clipper Gap and from there to Auburn, and by the end of the year the

ditch was practically finished to the county seat.

An office was opened in Auburn about that time, telephone lines built along the ditch and the whole line from Bear Valley down was an accomplished fact and ready for the public. Mr. M. T. Lawrence assumed the management of the Auburn district, with Mr. Smith as secretary. Mr. Smith was succeeded by Mr. W. R. Arthur, who afterward succeeded Mr. M. T. Lawrence as manager and was a few years ago succeeded by Mr. H. M. Cooper the right man in the right place to assume the duties and responsibilities of that most important office to which several light and water districts were soon added.

The South Yuba ditch, as it was generally known among the miners of this divide, was a success from the moment, almost, that it reached the gravel range of Placer County, no less so than it had been in Nevada County, whence came the story that it had earned enough "twenties" to pave it with those coins from the head of it to Nevada City. The men at the head of it, Charley Marsh and Jim Wartenbee, knew a good thing when they saw it. They were energetic, experienced men, with ample capital to back them which they were willing to risk. But they found it no easy task, by any means.

However, they inspired the men they dealt with with confidence in their ability and willingness to fulfill every agreement they entered into, and the result was that several miles of the ditch was built for no other consideration than water.

Soon after the season of '84-5 opened every ditch had all the water it could carry; this was before the monitor had reached this divide and the hose burst and "bucked" as of yore, no matter what ditch the water came out of. For a few years after the advent of the South Yuba many breaks occurred in its line. These, however, were unavoidable, and though very annoying and often causing interruption for days at a time in the water

supply at the mines, and nearly always breaking the miners' ditch as well, Mr. Gould and his associates, being men not easily discouraged, were soon at the scene, working often day and night; the damage was repaired, the water was turned in and all hands hiked for home. There were no "chug-wagons" in those days to carry the superintendents home; all joined in the procession, feeling that they had done their duty and "darn the expense." Mr. Holmes, who at that time was in charge of the South Yuba, did all in his power to prevent those breaks and to make amends, and soon these efforts produced a spirit of mutual self-help between the two companies.

After a few years Mr. Holmes was succeeded by Mr. Geo. Chaney, a young man from Nevada City, having been transferred there by Mr. Spaulding. His first work was to rebuild most the flumes, which he did in a very substantial way.

A time came, however, when the water sales fell off and it was no longer profitable for the company to keep up the line, and, except for a few months about '80-81, if I remember right, I had charge of it under pay, and for some time after that looked after it just for what little water I could catch during storms. Mr. George Chaney went to Arizona about that time. After, say 1882, the ditch was practically abandoned below Dutch Flat, except as a spillway to reach Canyon Creek, and water seldom came below the Polar Star mine. For the next eight years or so, I worked in the Pacific mine, so I can give very little information about what occurred during that time except

to say that I worked a short time on the new flumes in 1891 and again in 1892, when active ditch-digging began in July below Gold Run.

The work of reconstructing the old ditch from Bear Valley to Gold Run, and from that point the building of a new one to Auburn in so short a time, showed the kind of men that were at the head of it—John Spaulding and W. F. Engelbright. After the ditch was completed to Auburn both their foremen, Godding and Linder, returned to Nevada City and their homes. In 1905, however, Mr. Linder, having been tendered the foremanship from Bear Valley to Colfax, returned to Towle's and is now working in that capacity; always ready to face a regiment of difficulties.

The Pacific Gas and Electric Company next assumed control of the property, and about three years ago this grand old ditch was shorn of its name and ceased to exist under its old environments.

Among the men who entered the service of the South Yuba in the early days of its existence are Frank Godding, in about 1872; a Mr. Boarich, about the same time, who worked very many years tending Lake Fordyce and Lake Sterling and, as I am informed, is working there now; Mr. Dan Rich, who tended Lake Fordyce some years even before Mr. Boarich; Mr. L. D. Allen, who worked on the South Yuba twenty-eight years in Placer County, and Mr. Barth Murphy, who, I think, worked twenty-nine years on the South Yuba in Nevada County. As for myself, I have had charge of the Gold Run district since February, 1893, continuously.

GEORGE E. H. BETTEN.



Safety First! A Hint by the Office Boy

"Safety First" should be practiced by all as well as preached by a few.
Get busy and practice.

OFFICE BOY.

The International Gas Congress to Be Held in San Francisco in 1915

By E. C. JONES

THE spirit of fraternity among gas men seems to have begun at the organization of the New England Association of Gas Engineers in 1871. Like all great and lasting movements this mother of gas associations was formed over a martyr's bier. One afternoon during the winter of 1870 the Hon. James B. Blake, who was superintendent of the Worcester, Mass., Gas Light Company, and mayor of the City of Worcester, was mortally hurt in a gas explosion in the purifying house of the Worcester gas works; besides causing the death of this good man, so much beloved in New England, the City of Worcester was plunged in darkness. At Mayor Blake's funeral the gas men who had gathered from all parts of New England to pay tribute to this worthy man, many of them meeting for the first time, decided to form the first organization of gas engineers. The City of Worcester was lighted by gas the night of Mayor Blake's funeral.

Since this beginning of gas associations the growth of the business and the wide extent of territory covered by it prompted the formation of other associations, until now there are eighteen within the boundaries of the United States, one in Canada, and one or more in every foreign country, the last probably being the Imperial Gas Association of Japan.

In 1871 gas manufacture was a business filled with secrets, and each gas man went plodding along in his own way without knowledge of his neighbors' doings, and each probably thinking that his way was the best. Today the gas business, which is probably the second in importance of the great industries of the world, has no secrets connected with it, and every busy worker in the field is only too anxious to share his knowledge with his neighbor. This harmony of in-

terests has been created by gas associations. In the United States there are two great associations, the American Gas Institute, and the National Commercial Gas Association, each doing its work in what is supposed to be a separate field, but each is dependent upon the other, and the work bears the same relationship that eating has to cooking.

These two associations probably include in their membership nearly all of the members of the other sixteen associations of the country, and a meeting of either of them brings together a splendid body of men devoted to the gas business, and representing every nook and corner of this great country—from the Pacific to the Atlantic and from the borders of Canada to the Gulf of Mexico.

Through the medium of gas journals throughout the world there has been an interchange of ideas and methods which has brought the gas men of foreign lands close to their brothers in America, but to further promote the friendship and co-operation of the gas men of the world an International Gas Congress was called together during the Paris Exhibition of 1900. This congress was held at the Palais des Congres, September 3 to 5, 1900, and was attended by 1064 representatives of the gas industry from all parts of the world.

M. Théodore Vautier, President of the Société Technique de L'Industrie du Gaz en France, was president of the congress and twelve presidents of gas associations in different parts of the world presided for short periods over the sessions of the congress. There were twenty-eight papers on subjects relating to the gas industry read at this congress by representatives from the following nations:

France ten, Germany six, United States

four, Holland three, England, Austria, Denmark, Switzerland and Ecuador one each. The work of the congress extended over Monday, Tuesday and Wednesday, while Thursday and Friday were devoted to the exposition, Clichy Gas Works of the Paris Gas Company, and other excursions, besides social functions.

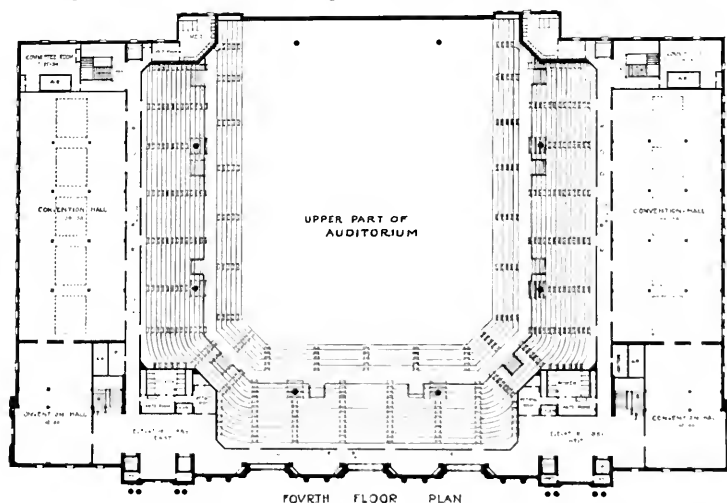
This congress was so successful in bringing together representative gas men of the world into closer friendship that it was suggested, through the initiative of Mr. F. H. Shelton then president of the Western Gas Association to have a Congress of Gas Associations of America in connection with the Louisiana Purchase Exposition in St. Louis in 1904, with Mr. C. J. R. Humphreys as chairman of the committee of arrangements.

This congress was held in Library Hall, Hall of Congresses inside of the Exposition grounds, June 15 and 16, 1904. Ten gas associations were represented and the attendance was 254. Five papers were read and ably discussed. The printed proceedings of these two gas

congresses are among the most interesting books in gas literature, and are milestones that mark the road of progress in gas engineering.

When San Francisco was selected as the exposition city to commemorate the completion of the Panama Canal, the Pacific Coast Gas Association decided that there could be no more fitting occasion to bring together the gas men of the world in an International Gas Congress than the celebration of this greatest of world's engineering achievements, and so San Francisco was selected for this Exposition and Gas Congress on account of the spirit of its people, and the wonderful location of the beautiful city covering the hills of the peninsula guarded by the Golden Gate. This charming cosmopolitan city on the Bay of San Francisco, with its charm enhanced by the delightful climate of California, is in itself a perpetual Exposition.

As far back as 1911 the Pacific Coast Gas Association at its meeting in Oakland, appointed a committee on Inter-



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national Gas Congress, and at the meeting held in San Diego in 1912, a delegate was named to attend the meeting of the American Gas Institute at Atlantic City during the month of October for the purpose of conveying an invitation from the Pacific Coast Gas Association to the American Gas Institute to participate in an International Gas Congress, to be held in San Francisco during the Exposition period, to take paternal charge of the congress, and to issue invitations to the gas associations of the world in the name of the American Gas Institute. This invitation was also accompanied by one from the Panama-Pacific Exposition Company to the American Gas Institute requesting that its annual meeting be held in San Francisco in 1915. The delegate was courteously received, and there was much enthusiasm in favor of visiting California during the fair.

It was unanimously voted that the American Gas Institute should hold its annual meeting in 1915, and participate in an International Gas Congress to be held in San Francisco during the week beginning September 27, 1915. A committee of nine members was appointed to arrange the preliminary details. This committee issued invitations to all of the gas associations in the United States and Canada to participate in the congress, and name a delegate to represent the association on the committee, and as these invitations were accepted the name of the committee was changed to the joint committee on International Gas Congress, San Francisco, 1915. Sub-committees were appointed to attend to the various details of the congress, and after several meetings the joint committee extended invitations to all of the gas associations of the world to participate in the congress.

There have been many acceptances of these invitations, and delegates have been appointed to attend the congress. At the meeting of the American Gas Institute, held in New York in October, 1914, the previous vote taken to meet in San Fran-

cisco was confirmed by a unanimous vote to hold its 1915 meeting in San Francisco beginning September 27, 1915. The Institute also elected as its president, E. C. Jones of San Francisco, who had been previously honored by being elected President of the Pacific Coast Gas Association. This was a graceful compliment to the State of California.

At the meeting of the Gas Congress committee held in New York immediately following the meeting of the American Gas Institute, Dr. Alex. C. Humphreys was elected president of the International Gas Congress, and the presidents for 1915 of the gas associations participating in the gas congress were named as vice-presidents.

The selection of Dr. Humphreys is particularly happy, inasmuch as he represents the gas industry of the world, and at the present time while he is a member of nearly every gas association and other scientific societies, he does not hold office in any gas association, and it is felt that his selection as president is acceptable to all gas men, and it is hoped that under his able management all of the gas associations representing different geographical sections and departments of the business may be brought together in harmony and accord.

"The president and directors of the Panama-Pacific Exposition have from the first recognized the desirability of providing for a series of congresses that would exceed in scope and excel in character anything heretofore attempted and that would stand as a monument long after the material features of the exposition have been forgotten, and for the accommodation of these many gatherings the exposition has provided the Exposition Memorial Auditorium, at a cost of more than one million dollars."

This auditorium occupies the entire block bounded by Grove, Larkin, Hayes and Polk streets, forming a part of the Civic Center, easily accessible from all sections and directly adjacent to Market street leading to the gateways of the



The Auditorium, San Francisco, where the International Gas Congress will be held.

city—the ferry and steamship terminals on the water front.

"The Auditorium is being erected by the exposition for the special use of the congresses and conventions to meet in San Francisco in 1915. The building and equipment will cost \$1,250,000. The lot on which the auditorium is being built was provided by the city at an additional expense of \$701,000. Following the close of the exposition on December 4, 1915, the auditorium will be given to the City of San Francisco as a permanent memorial of the exposition.

"The auditorium has eleven halls, each with a seating capacity of from 400 to 10,000 people. In addition to the eleven halls there are nineteen rooms suitable for committee meetings, or meetings of small convention sections, each of the nineteen rooms seating from 30 to 125 people. By a system of rolling partitions the four large halls on the third and fourth floors may be converted into a maximum of fourteen halls, each with a maximum seating capacity of 250 people. The seating capacity of the main auditorium is estimated at 5,000 for the ground floor and 5,000 in the balcony."

The entire fourth floor of this auditorium has been reserved for the exclusive use of the International Gas Congress during the week beginning September 27, 1915. This floor has two large halls 58x138 feet with two committee rooms adjacent and by the use of rolling partitions each of the large halls may be changed into five smaller halls, seating about 250 people. The two large halls on the fourth floor are lighted by skylights in addition to the window lighting. The fourth floor also has two halls each 41x64 feet directly connected with the larger halls and to the main corridor, so they may be used independently.

"All of the rooms in the building are well lighted by electricity. Provision is made for intercommunicating telephone service, call bells, etc. Heating and ventilation are supplied by fans in the basement furnishing fresh warm air to all the rooms in the most approved manner. The fresh air taking the place of the air removed from the rooms by exhaust fans on the roof."

It is proposed to have sessions of the congress each day beginning Monday,

September 27th, from 10 a. m. to 1 p. m., thus leaving the afternoons open for the annual meetings of the various gas associations, and allow ample time to visit the exposition and other points of interest.

The hotel accommodations in San Francisco are ample and excellent and every taste in appointments and price may be easily satisfied. When it is remembered that the new city of San Francisco is less than nine years old, and all of the hotels and apartment-houses are of the best modern fire-proof construction, finished and furnished in keeping with the best taste of today, there need be no fear by the most exacting traveler as to comfortable hotel accommodations.

This matter is in the hands of a committee of the Pacific Coast Gas Association and at the present time one hundred rooms, with baths, have been reserved at the Palace, St. Francis and Fairmont hotels, the principal hotels in San Francisco, and this committee is prepared to make reservations in any of the large number of first-class hotels to suit the wishes of the visitors to the congress.

The details of the congress are in the hands of sub-committees of the joint committee in the East, covering the departments of Arrangements, Publicity, Transportation and Invitation; and the committee on Papers, under the able chairmanship of Mr. Allen S. Miller, is already busily engaged in securing papers from representative gas men throughout the world, covering the fields of activities in the gas industry.

The local arrangements for the congress are being handled by a committee of which Mr. John A. Britton of San Francisco is chairman, and this in itself assures success under his skillful management. Sub-committees will attend to the necessary arrangements at the meeting, of halls, registration, care of baggage, local transportation, hotel accommodations and the reception and entertainment of visitors.

The Panama-Pacific Exposition buildings and grounds are rapidly approaching completion and exhibits are now being installed, so that on the opening day, February 20th, it is promised that everything will be in readiness to receive visitors.

The exposition is like fairyland, and its equal has never been attempted in size or beauty and marvelous color effects.

It is the earnest hope of the Pacific Coast Gas Association that San Francisco shall be the Mecca of all gas men during the Gas Congress.

The following gas associations in the United States have voted to participate in the International Gas Congress and have selected prominent members to represent them on the Joint Committee on International Gas Congress:

American Gas Institute,
Empire State Gas & Electric Association,
Guild of Gas Managers of New England,
Illinois Gas Association,
Illuminating Engineering Society,
Indiana Gas Association,
International Acetylene Association,
Iowa District Gas Association,
Michigan Gas Association,
National Commercial Gas Association,
Natural Gas Association of America,
New England Association of Gas Engineers,
New Jersey State Gas Association,
Pacific Coast Gas Association,
Pennsylvania Gas Association,
Society of Gas Engineering of New York City,
Society of Gas Lighting,
Southern Gas Association,
Southwestern Electrical and Gas Association,
Wisconsin Gas Association.

The Gas Industry-at-Large is represented by Dr. Alex. C. Humphreys, president; past president American Gas Light Association and American Gas Institute; president Humphreys and Miller, Inc., Buffalo Gas Company and Stevens Institute of Technology.

England has come to the front in being the first foreign country to officially accept the invitation to participate in the International Gas Congress, and at the meeting of the Council of the Institution of Gas Engineers of England, it was voted to participate, and Mr. Edward Allen, M. I. C. E., a past president of the institution was named as the delegate to the congress to represent the Institution of Gas Engineers of England.

Spectacular Baseball Battle Thrills Beholders

Described by WALTER D. SULTAN, an Eye-witness

THE much heralded baseball game between the Auditing Department and the combined forces of the Treasurer's and Purchasing Departments was played on St. Ignatius field on November 21, 1914, in the presence of a large and enthusiastic crowd of company employees and their friends.

Vice-President John A. Britton and Chief of Police D. A. White acted as umpires and the Pacific Gas and Electric Company's band dispensed the latest popular music. The final score at the end of the seventh inning stood 14 to 4, with the Auditing Department claiming the smaller figure and Umpire Britton—some said in the interest of suffering humanity—calling a halt.

The game had been advertised as an impending battle between giants, and the challenges and counter-challenges of the rival commanders were published in *PACIFIC SERVICE MAGAZINE* and fearfully discussed by the non-combatants. After witnessing the bloodless affray, however, one spectator said it was more a rout than a battle, while another well versed in the war news of the day alluded to it as a debacle. But the score neither indicates the intensity of the struggle nor illustrates the brilliant and sparkling plays that were so abundantly sprinkled throughout, making a detailed analysis of the game by innings impossible.

For the losers the strategical work of Keane as pitcher stands out as being well worthy of mention. In the fourth inning, with two men on bases, Keane began to get wild, so that he walked five men, but his consummate strategy was apparent when the sixth man, a weak hitter, was struck out. Charlie was loudly applauded for his great work. His cunning, however, was evidently not appreciated, as he was relieved in the next inning by Leslie Murphy, who lasted but

one session and was derricked in favor of Humphreys who finished the game for the "pen pushers."

Morris, the left fielder, who is a product of Humboldt High School and one of its most noted Rugby footballers, unfortunately donned his football suit that morning by mistake, and when the ball was hit to his territory insisted on dribbling it down the field, giving a great exhibition of the Rugby game. He almost met with disaster, however, when he kicked the ball beneath the bleachers and had to crawl underneath to retrieve it. It took two men and a lot of swearing to extricate him from beneath the seats when he started to climb out.

Goble, the center fielder, was also a footballer of note in his college days, but he played the old American game and insisted on falling on the ball for a touchdown every time it came his way. It is only fair to say, however, that he was handicapped by his waistcoat, which he wore unbuttoned so that it flapped around in the breeze, greatly hindering his locomotion. Some unkind fan hinted that he must have had the "makins" in his vest, he seemed so attached to it.

Reed, second baseman for the "scribblers," an old Columbia grad, who was known as one of the fastest sprinters on the track team of his day, gave a great sprinting exhibition when he knocked the ball into the bleachers in the fifth inning. Unfortunately the band started up "It's a Long Way to Tipperary" as Reed turned second base, and by the time he reached third he thought the home plate was even farther away than Tipperary and he walked the last lap only to find the ball awaiting him. Reed protested that they had moved the bases on him so as to fire him out, but his protest was disallowed.

The fielding of Byers, Smith and Jenny resembled a chunk of Swiss cheese.

Crowley, Barthol, Vallejo and Swan starred for the winners, while some of the spectacular catches of Dazey were even a surprise to himself. Swan succeeded in getting spiked a few times, but outside of his damaged trousers he escaped unscathed. Crowley was hit freely, but with the aid of a phenomenal run of luck and the defective vision of Chief White he was saved from many a tight hole.

The thanks of the Auditing Department are tendered to St. Ignatius College for donating the grounds, as the game was in the nature of a benefit to a former employee of that department who has been very ill for some months and is in need of financial assistance. Everybody,

including the losers, derived a lot of fun from the game and unanimously conceded that the band played fine. Following is the score:

AUDITING DEPARTMENT

Players	A.B.	R.	H.	S.B.	P.O.	A.	E.
Murphy, ss.	4	0	1	1	2	1	1
Keane, p.	3	0	2	1	0	5	0
Jenny, 1b.	3	0	1	0	7	1	0
Hall, c.	1	1	0	0	4	0	1
Smith, rf.	2	1	1	0	0	0	0
Goble, cf.	2	0	1	0	0	0	0
Morris, lf.	3	1	1	0	0	0	2
Reed, 2b.	3	0	1	0	5	0	3
Byers, 3b.	2	0	1	0	0	0	2
Humphrey, 3b.	1	1	0	0	0	2	0
Total....	27	4	9	2	18	8	9

TREASURER'S AND PURCHASING DEPTS.

Deutsch, 1b.	3	3	1	3	6	0	0
Crowley, p.	5	2	3	1	1	5	0
Mensing, c.	3	2	2	1	10	2	1
Barthol, 2b.	4	2	3	0	1	1	1
Hornberger, lf.	1	1	0	0	0	0	0
Murphy, cf.	1	1	1	0	0	0	0
Swan, ss.	3	1	2	1	1	2	1
Vallejo, 3b.	1	2	2	2	1	0	1
Dazey, rf.	1	0	1	0	1	0	0
Total....	34	11	15	8	21	10	4



"MEDICINE FOR THE MIND."

The Charles H. Tenny & Co., a large corporation of Boston, Mass., sends us copies of their "Tenny Service."

Mr. A. B. Saurman, manager of the Standard Underground Company has given us their latest bound bulletins.

Mr. F. J. Southerland of the Alameda County District has donated a very fine bound treatise on "Wireless Telegraphy."

The Department of Mines of the Canadian Geological Survey at Ottawa, Canada, is sending us valuable technical literature and maps.

The summary of the Labor Laws of the United States Bureau of Labor Statistics, presentation of which has been

acknowledge, is an "eye opener" on labor facts.

Hon. Julius Kahn has presented a bound memorial on the Hon. Sylvester Clark Smith, late representative of California.

Mr. W. A. Hillebrand, an engineer of the electric distribution department and formerly connected with the Stanford University as an associate professor, has presented a complete set of the Cyclopaedia of Applied Electricity, elegantly bound.

The number of bound books on hand, December 1st, was 536; pamphlets, 2656; maps 32.

An English Rival of the Sir Joseph Hooker Oak

IN THE April number of PACIFIC SERVICE MAGAZINE there appeared an item concerning a wonderful spreading oak tree called the Sir Joseph Hooker oak, on the Bidwell ranch near Chico, claimed by Manager Heryford of Chico District as the largest in the world. In the July number was printed a letter from W. A. Setchell of the Department of Botany in the University of California, giving some

interesting data concerning famous oaks in this part of the world.

And now comes word from far away England concerning an historical oak tree that flourishes in the heart of Gloucestershire, a western county famous for its pastoral scenery. We have received the following from an evident reader of PACIFIC SERVICE MAGAZINE and which will be of interest to many:

Birchamp, Nr. Coleford, Glos.
27th, August 1914.

Editor PACIFIC SERVICE MAGAZINE,
Dear Sir:

Referring to your article on Sir Joseph Hooker's oak in PACIFIC SERVICE MAGAZINE of July last, I think that the enclosed photograph of the Newland (Glos.) oak may interest you.

It is said to have been mentioned in Domesday Book, but I cannot vouch for this.

I may add that my great grandfather, William Roscoe, of Liverpool, was a friend of Sir Joseph Hooker.

Yours faithfully,
WILLIAM M. ROSCOE.



The Newland oak, near Coleford, Gloucestershire, England. It is 13 feet in girth and one of the largest in the United Kingdom.

“Pacific Service” Tennis Club Gives Thanks for Its New Courts

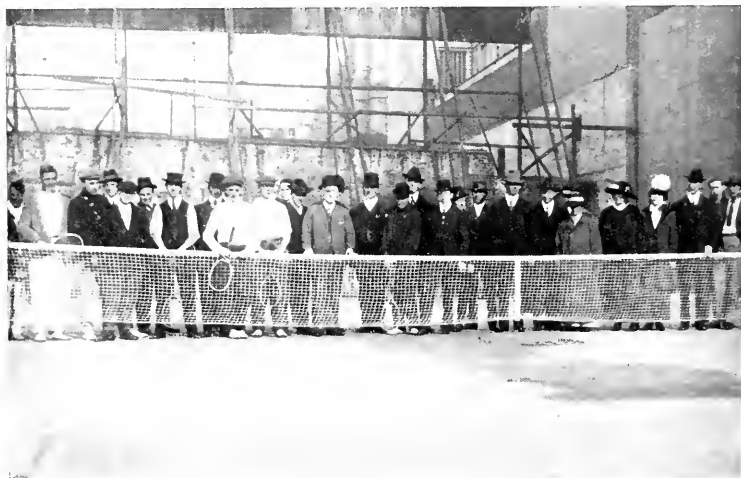
By R. E. FISHER

THANKSGIVING was an appropriate time, surely, for members, patrons, and friends of our “Pacific Service” Tennis Club to formally open the new courts whose construction was announced in the November issue of PACIFIC SERVICE MAGAZINE.

As already announced, these courts are located at the northeast corner of Powell and Post streets, in San Francisco, in the basement of the old Savoy Hotel which was destroyed in the fire of 1906. The lease of the property having been secured from the owners, the Parrott estate, two full-size double courts were laid out, with ample room on the side lines and plenty of space for spectators within the boundary walls. Entrance to the courts was made through the company's lot on Sutter street adjoining our main office building, but this is regarded as a temporary entrance only, for it is proposed to

construct another approach from Post street.

Needless to say we are proud of our new courts, and it was fitting that on the opening day the sky overhead should be of unblemished blue and that old Sol should bestow his kindest smile upon the scene. About one hundred of the company's tennis enthusiasts gathered at the nets and at the appointed hour Mr. John A. Britton arrived to conduct the opening ceremonies. A few introductory remarks were delivered by Mr. E. B. Henley, explaining how the tennis club came to be inaugurated and announcing that every employee of the company was eligible for membership. Then followed Mr. Britton, in his usual happy manner declaring his belief in active participation in all kinds of outdoor sports and pointing out that clean outdoor sports, such as tennis, invariably made for clean men and women.



Members and supporters of the “Pacific Service” Tennis Club lined up at the net.



John A. Britton about to serve the first ball.

In the course of his remarks Mr. Britton gave us a pleasant surprise by affording us an insight into the company's plans along the lines of employees' welfare work, such as is being carried out by some of the Eastern central station companies, wherein "Pacific Service" will undoubtedly set a new standard for employees' welfare.

Upon the conclusion of his remarks Mr. Britton took his place on the firing line with Mr. P. M. Downing on the opposite side of the net. Mr. Britton then demonstrated a different kind of service than "Pacific Service." Suffice it to say that Mr. Downing was utterly unable to return the service. Thus a new chapter in the athletic activities of the company was opened which bids fair to become one of the most popular, being the least expensive and the most beneficial of all sports.

After an inspection of the courts Mr. Britton gave instructions for dressing rooms for both women and men members to be fitted up at the company's expense.

Two interesting exhibition matches were played. Messrs. Dodge and Vensano trounced Messrs. Munroe and Szczepanski, and then followed a match between Messrs. Weymouth and Vincent vs. Rogers and Fisher, in which Weymouth and Vincent were victors.

The regular tournament play was then started. Vincent and Fisher won over Rogers and Szczepanski, score 2-6, 6-1, 6-4.

This tournament will be continued through the winter, weather permitting. It is hoped in this manner to develop and encourage new players.

The close proximity of the courts to the main building, which is so centrally located in the business section, makes the courts convenient to all.

As previously stated, the club and courts are open to all employees of the company, male and female. A small entrance fee and monthly dues are made necessary on account of rent and incidental expenses. This is so small, how-



Paul Downing revives ancient memories.



Mr. Britton awaits Paul Downing's
"pacific" service.



Brothers Vincent and Fisher, present champions,
in action.

ever, that it should not prove burdensome to any one.

We wish to express our appreciation and gratitude to the following firms:

Pacific Hardware & Steel Company, contribution of one tennis net.

Wright & Ditson, athletic goods house, contribution of one tennis net.

Swan, the painter, "Pacific Service" tennis sign.

Ames Harris Neville Company, burlap for dressing rooms.

We tender our thanks to Mr. C. Anderson, building superintendent, for his courtesy and help in the many favors he extended to us during construction.



What 2,000,000 Kilowatt Hours Will Do

To supply the consumers of electric power of the Pacific Gas and Electric Company about 2,000,000 kilowatt hours per day must be generated and fed into the company's transmission lines.

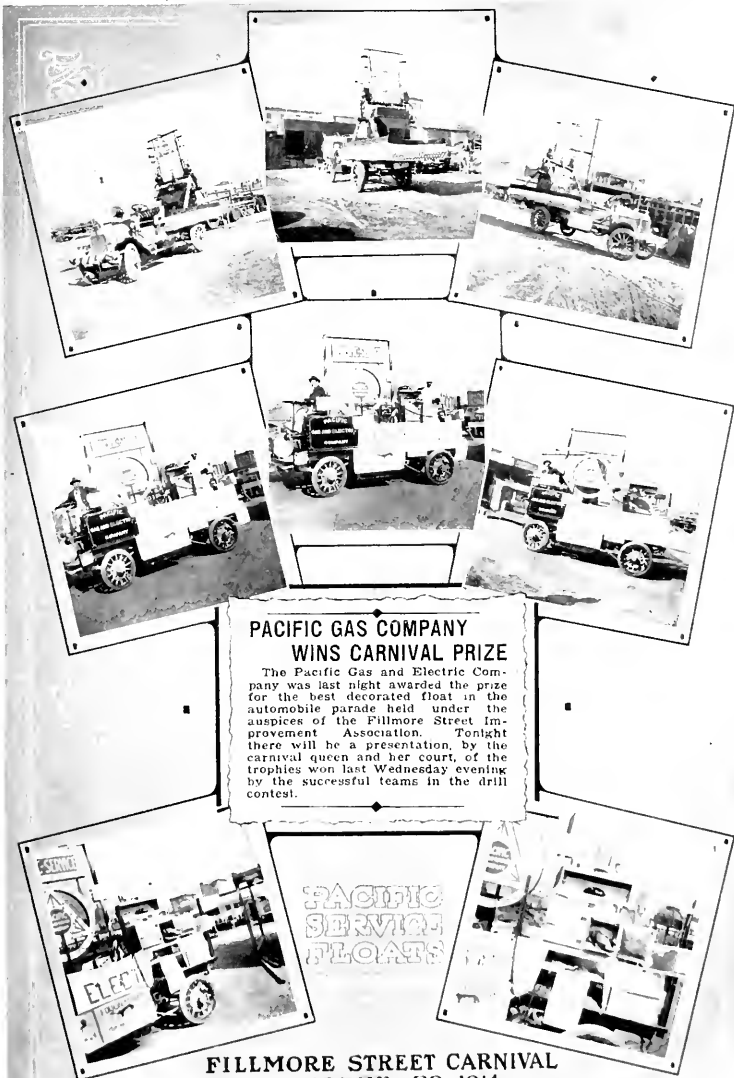
This amount of power would propel a large street car, such as one of the cars of the Municipal Railway, a distance of about 400,000 miles, or sixteen times around the world. At twenty miles per

hour the car would be two years three months and ten days in making the trip.

A toaster or flat iron could be used continuously for 4,000,000 hours, or 456 years, or a 40-watt tungsten lamp 5,700 years.

If the power were expended in lifting, 245,000 men could be carried from sea level to the top of Mount Shasta, which is two and three-quarter miles high, in one hour.

J. P. JOLLYMAN.



The Financial Side of "Pacific Service"

DISTRIBUTION OF PACIFIC GAS AND ELECTRIC COMPANY SECURITIES

On August 15, 1914, the Company announced the sale of \$8,750,000 par value of its new issue of First Preferred 6% Stock. The following table shows the distribution of this issue:

FIRST PREFERRED STOCK ISSUED AND
SUBSCRIBED FOR

	NUMBER OF SUBSCRIBERS	PAR VALUE OF SHARES TAKEN
Employees	1621	\$ 548,600
Customers	1162	1,325,600
Stockholders, etc.	712	6,875,800
Total	3495	\$8,750,000

The participation of employees and consumers of the Company is particularly noteworthy. Sixteen hundred and twenty-one of the Company's employees, constituting about 40% of its permanent staff, have become shareholders, and eleven hundred and sixty-two of the Company's consumers have purchased \$1,325,600 worth of the new stock. Additional sales to investors in the Company's territory are being made at the average rate of about \$10,000 per day, and the allotment of stock set aside to meet anticipated demands of consumers as set forth in the Company's circular letter of August 15, 1914, promises to become exhausted in the very near future.

The Company now has outstanding about \$51,000,000 par value of stock, including its Common, Junior Preferred and First Preferred. As shown in the following statement, almost one-half of this stock is owned on the Pacific Coast. The proportion of Pacific Coast holdings has increased almost 10% during the last six months, and with the continuing distribution of First Preferred Stock among local investors will probably show further increase. Of the total number of individual stockholders, 3,976, almost 70% of the total number, are residents of California, having first hand knowledge of the Company's properties, business and management. That this substantial and widely distrib-

uted local ownership is an element of great value to the Company goes without saying.

GEOGRAPHICAL DISTRIBUTION OF HOLDERS OF ALL
CLASSES OF CAPITAL STOCK (ISSUED AND
SUBSCRIBED FOR)

	NUMBER OF HOLDERS	SHARES	PAR VALUE
Pacific Coast.....	3976	234,751	\$23,475,100
Middle West.....	768	65,874	6,587,400
Eastern Coast.....	665	165,459	16,545,900
Europe.....	383	42,509	4,250,900
Total.....	5792	508,593	\$50,859,300

“SUNSET MAGAZINE” COMMENT ON OUR NEW FINANCING.

The “Sunset Magazine” for December contains an article in its investment department entitled, “Utility Stocks vs. Bonds,” in which, among other things, the following intelligent comment is made on the new financing recently accomplished by this Company through the issuance and sale of its First Preferred 6% Stock:

In view of the bond market's reluctance to absorb new issues from any source, the Company decided to put out a stock issue, approved by the Railroad Commission and made attractive to investors by surrounding the new shares with safeguards that placed them almost in the class of bonds, so far as safety is concerned.

The stock was sold at \$82.50 and the dividend rate was fixed at 6 per cent, thus producing a yield of 7.27%. This prior preferred stock was given first call on the earnings of the Company after the deduction of operation, maintenance and interest charges on the funded debt; before the common or the preferred stock of older issues can participate in the earnings, the demands of the new prior preferred stock have to be satisfied. Thus the dividend on the new stock is made a lien on the earnings following immediately after the bonds.

In the case of the issue under discussion the safety of the investment, given efficient management of the utility, seems unshakable. The concern's gross earnings increased from less than nine millions in 1906 to more than sixteen millions in 1913; its revenue available for dividends, depreciation and surplus requirements has grown from \$3,928,644 in 1910 to \$4,083,570 in the year ending September 30, 1914. Its gas and electric rates are not subject to arbitrary sweeping reductions and it is the policy of the California Railroad Commission to protect utilities giving good service at reasonable rates against cut-throat competition. Furthermore, the Commission exercises stringent supervision over the financing of utility corporations and the old-time manipulation and inflation of their capital is now almost an impossibility. Though many corporations continue to complain about the rigors of supervision, the exactions of the State are of unquestioned value in the raising of new capital as they reinforce the confidence of the investing public.

Pacific Service Magazine

PUBLISHED IN THE INTERESTS OF ALL EMPLOYEES OF
THE PACIFIC GAS AND ELECTRIC COMPANY

JOHN A. BRITTON - - - - EDITOR-IN-CHIEF
FREDERICK S. MYRTLE - - - - MANAGING EDITOR
A. F. HOCKENBEAMER - - - - BUSINESS MANAGER

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at 445 Sutter Street, San Francisco

The Pacific Gas and Electric Company desires to serve its patrons in the best possible manner. Any consumer not satisfied with his service will confer a favor upon the management by taking the matter up with the district office.

VOL. VI. DECEMBER, 1914. No. 7

EDITORIAL

Once more Yuletide is upon us and, one and all, we hail the coming of Santa Claus in the good old-fashioned way. No matter whether the rich red blood of youth courses through his veins, or whether the frost of many winters whitens his hair, there is not one of us, surely, who is not prepared, nay, eager, to seize the opportunity held out to cast the responsibilities of life from him, to put off, for the nonce, the mask of gravity that is held compatible with grown-up manhood and become, for an all too brief period, a boy again, to play among boys and girls as he made his elders do when he was a boy.

So, as we cast the Yuletide spell upon ourselves and through our mental vision picture old Santa Claus, in time honored garb of scarlet and white, his jolly red face glowing with the reflected glory of his message of comfort and cheer, his sturdy shoulders bowed beneath the weight of timely gifts, none among us, surely, is too world-worn to feel his heart beat with the throb of joyous expectancy.

It is an eventful season, always, and this year, we feel, it is more than ever so. Its watchword, "On earth peace, good will toward men," bears a special significance to us just now, as from our vantage-point of peace and prosperity we look up at the sun that smiles so kindly

upon this favored land and reflect that the same sun shines just as kindly upon lands across the seas that are being laid under an awful desolation.

Are we not favored above all people, we men and women of California, who know not the meaning of real hardship? Ought we not at all times to give thanks to kind Fate that our lines are cast in pleasant places? And is not this Yuletide season of 1914 one above all that have gone before in which our hearts should sense the very joy of living?

Speaking for ourselves of "Pacific Service," it would seem to us that in keeping step with the march of progress we have been so peculiarly fortunate that each year we can point to some event in the record of happenings directly affecting us and our welfare that makes our holiday-making more than ordinarily light-hearted. We who take pride in "Pacific Service," its achievements and development, feel that we can look the world in the eye as this year of 1914 draws to a close and say that we have done our share, have added our quota to the sum total of advancement.

Last year, if you remember, we celebrated the successful completion of our greatest "Pacific Service" undertaking to date—the South Yuba-Bear river development, that has already added so much to our resources, has gone so far toward enabling us to guarantee to our patrons the "perfect service" that we hope to make synonymous with "Pacific Service." This year we have another event to celebrate, one which, in a sentimental way, certainly, means more to us than the successful outcome of any constructional undertaking, no matter how remarkable from an engineering standpoint, no matter how gratifying from the standpoint of revenue.

This has been no ordinary year with us, this year of 1914 now closing. You who have followed the fortunes of "Pacific Service" can appreciate with what pride we point to the success of our plan for permanent financing. It was surely

a red-letter day for "Pacific Service" when we were able to announce to the world that within the time limit set for the success or failure of the plan its operation had been made sure by the subscription of upwards of seventy per cent of our issue of \$12,500,000 first preferred stock.

That the success of the plan meant much to us in a business way goes without saying; it meant as much, if not more, to us in another way. What did most, perhaps, to plant the feeling of pride in our hearts was the knowledge that the success of our plan was attributable not only to the co-operation of our present stockholders, to whom the offer was first made, but, also, to that of our employees and our consumers.

It had always been the aim and ambition of the officers of "Pacific Service" to have the company classed as a peculiarly California institution, doing its business with and distributing its profits among the people of the state. That ambition was substantially realized when our employees and our consumers came forward in response to our invitation to become actual partners in our enterprise. As a San Francisco daily newspaper expressed it, "A new trail was blazed through the jungle of finance." And we who have blazed that trail are proud and feel that we have a right to feel proud of the achievement.

We are glad to give open expression to our appreciation. To those who so substantially demonstrated their implicit confidence in our undertaking and in us we give seasonal greeting of the heartiest kind. Our greeting is no less heartily to all members of our "Pacific Service" family, to all patrons and friends, who whether they have or have not taken occasion to join us in partnership hold our welfare deep in their hearts.

Members, patrons and friends of "Pacific Service," readers of *PACIFIC SERVICE MAGAZINE*, we wish you, one and all,

A MERRY CHRISTMAS AND A
HAPPY NEW YEAR!

The women of the company have played no unimportant part in the publication of the magazine since they have been given an opportunity to voice their ideas. The many interesting features that have appeared under their signatures have been the means of bringing the women of the company into closer contact with one another, thereby creating a feeling of comradeship that would not otherwise exist.

We hope during the coming year to receive the hearty co-operation and support of the women of all departments and districts to help make this section of the magazine one of the most important and interesting features, and the editors of this department take this means of expressing to the women of the company their thanks for the interest already manifested.



"Safety First" Means a Lot of Things

It means a large expense to the employers of labor in the installation of costly devices, such as guards, platforms, railings, new tools, goggles, rubber gloves, etc., for the protection of the workmen.

It means constant care and supervision of individuals over everyday conditions and in every place in which an accident may happen.

It means being constantly on the alert and constant control of your wits.

It means thoughtfulness for others, and the noble execution of the Golden Rule.

It means co-operation.

It means better men, better success and likewise better remuneration.

It means happier homes and healthy children.

It means whole hands, whole feet and legs as God made them, two bright eyes in every head, strong muscles, active brain, thankful appreciation of life and the chance every man has in this great land of liberty.

Did you ever look at it this way? It is the truth, every word of it.

Remember that "Safety First" means these things always. V. R. H.

"Pacific Service" as an Aid to Nature in Golden Gate Park

By A. L. HARRIS, Industrial Department.

IN Golden Gate Park, "To him who in the love of nature holds Communion with her visible forms, she speaks A various language."

where nature has done much to enhance the general scheme of design, there is a chain of artificial lakes which stretch from northeast to southwest, and, surrounded as they are by native shrubbery, bamboos and grasses, add much to the natural charm of the landscape, while also serving an important purpose as reservoirs.

In reclaiming the sand wastes from Strawberry Hill to the Pacific Ocean, the Park pumping plant was found insufficient to supply the additional water most essential to the life of the Park, on account of the limited supply of the wells. A survey and inspection of the vast area west of Strawberry Hill revealed a capacious flow of water toward the ocean, and in order to utilize this natural drainage for the reclaiming of the middle and western divisions of the Park the trade winds were harnessed to give the power necessary to lift the water to an altitude of 200 feet. The north Dutch windmill, adding a picturesque feature to the landscape, was installed, with a capacity of 30,000 gallons of water per pump per hour, supplying and replenishing Lloyd Lake, Metson Lake, Spreckels Lake and the future Lincoln Park. In the dry season the sump, 12 feet deep, shown in the picture, has a mill capacity for two sets of pumps for twelve hours, and drains the back hills through springs in the following period. The water is fresh, purified and filtered through the sand hills, and has no taint whatsoever of the salt water in the ocean close by.

From time immemorial, humanity has utilized the wind for pumping power purposes, but Holland, a land below sea level, was the first country to use the sail mill and construct large units, de-

picting on the Delph, Royal Copenhagen china, and other manufactures, their country's safeguard. It was an old

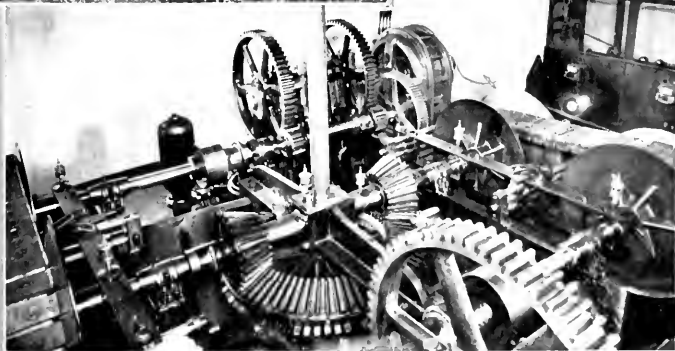
idea with foreign insurance companies to equip ships with windmill for pumping ship, and a Norwegian square-rigged ship may be known by the windmill before the main mast. A sailor is a better operator of the Dutch windmill than an engineer, for the winds are erratic in their course and nature's laws must be obeyed to give up the unseen power.

From the ground one hardly realizes the size of the Dutch windmill in the Park. The base consists of 5 feet solid concrete, 33 feet outside diameter, the walls for one story 3 feet thick and above the structure is heavy mill construction. The arms are 102 feet, tip to tip, made of Oregon pine 16"x20" at the center, reinforced 16 feet either side of the hub by two iron plates, $\frac{3}{4}$ "x16" straps bolted together every 12 inches. The sail is stretched on a frame, the ribs of which, spaced a foot apart, are strapped and bolted to the arm, across one edge, and its propeller shape is formed by different angled wedges on one side of the arm, held in place by rib-holding straps. The dome-shaped top with sails is separate from the building, constituting a turntable, revolving on 24 flat wheels, operated by a small windmill placed diametrically opposite to the sail arms to adjust the mill to the direction of the wind; and the movement between the four points of the compass is controlled by a weighted friction clutch on the main shaft. The turntable weighs 12 tons; hub, shaft and bevel gear 18 tons; the vertical 5" transmission shaft through five floors and four solid couplings 6.5 tons, revolving on a ball-bearing immersed in oil.

Operating in mesh with the bevel gear



at the foot of the shaft revolve two bevel gears on the ends of shafts connected to adjustable cone-shaped pulleys (in two parts), belt-connected to the gear shaft, meshed to the gears on the pumps. The transmission belt is made up of sections (two pieces of wood $14" \times 3\frac{1}{2}" \times 1\frac{3}{4}"$ bolted together with leather belt between), the friction power being taken from the ends of the same on the cone pulleys. By operating a cleaver-screw hand-device, at the same time that the driver cone pulley is separated (lessening the pulley diameter) the driven cone pulley is drawn together, thereby adjusting the speed to the velocity of the wind. Beyond



the limit of the adjusting device the sails on the arms must be shortened, allowing the wind to go through the lattice work of the frame. In Holland, shutters take the place of sails and can be automatically opened or closed as the velocity of the wind requires.

The pumping equipment consists of two Dow Vertical Triplex Power Pumps, 8"x10" plungers, three stage and 45 R. P. M. with 6.53 G. P. R. The capacity of the mill with wind power is limited to 80 lbs. pressure, and with development of Lincoln Park a pressure of 180 pounds (corresponding to approximately a head of 400 feet) was needed, necessitating additional power. For this purpose, the Pacific Gas and Electric Company installed a 60 horse-power G. E. 2,200 volt 2-phase 900 R. P. M. motor for each pump, thereby giving sufficient power to accommodate the limit in capacity of the machinery installed. With a rawhide shrouded pinion on the motor for direct connection, the motor by one screw on the base may mesh with the gear on the shaft for the motor drive when additional pressure is needed or the velocity

of the wind is insufficient to operate the mill under 80 pounds pressure. With limited space for the 2,400 volt compartment, the installation was made with absolute safety by the Farnsworth Electric Works under plans and specifications submitted by our Industrial Department. The result, with the distribution of lights, reflects credit on both.

The public spirit of Samuel G. Murphy is well manifested in his donation to the Park of the south Dutch windmill, the largest in the world, together with the Lodge close by, at a cost of \$25,000. This mill has a capacity of 40,000 G. P. H. under 80 lbs. pressure, 40 R. P. M.

And it is but a matter of time when this windmill also will be equipped with motors to supply the much-needed water for irrigating that side of the Park. Superintendent John McLaren, who looks upon Golden Gate Park as his life's work, has more than once expressed his appreciation of the enormous benefit to the north side rendered by the electrical installation here described and to which "Pacific Service" contributes the power.



Purchasing Department Keeps Busy

The following are a few of the larger contracts recently awarded through the Purchasing Department:

Contract with Frank R. Wheeler covering the purchase of a turbine-driven blower for the Potrero gas works.

Contract with the Judson Manufacturing Company covering the purchase of structural steel for the extension to Station "A," San Francisco.

Contract with the Pacific Foundry Company covering the purchase of castings and fittings for the Potrero gas works.

Contract with Duncanson-Harrelson Company covering the removal of lamp

black and driving piles at Station "B," Oakland.

Contract with Messrs. Reed & White, covering brick work for the extension to Station "A," San Francisco.

Contract with the Western Iron Works covering the purchase of structural steel for Station "K," San Francisco.

Contract with the United States Metal Products Company for ingot iron and wire glass roof for generator building, Potrero gas works.

Contract with the Cyclops Iron Works covering the purchase of a 20-ton traveling bridge crane for Station "K," San Francisco.

DOINGS

of "PACIFIC
SERVICE" SECTION

N.E.L.A.

CHRONICLED BY ERNEST B. PRICE

A most attractive feature of the November meeting of our company section, held on the evening of Friday, November 13th, was an address by the Rev. Dr. J. Nieto on the subject of "The Problem Concerning the Relations Between Capital and Labor."

The eminent Jewish clergyman has made a study of the labor question both at home and abroad, and his remarks were most attentively listened to. In opening, he called our attention to the fact that we were living in a transitory age and that fundamental changes were taking place in all activities of life. In the relationship between capital and labor, he said, there was an unmistakable shifting of the moorings, so that we were drifting from previously accepted standards. In the early days the working man was merely a machine and did what he was told to do without question, taking little heed of the welfare of his neighbor. He lived and died in the groove made by his ancestors and uncomplainingly accepted conditions far from just. The church recognized the great inequality in the distribution of the world's material things of life, but the wistful questions of the primitive mind were met by ready assurances that in the Hereafter the toiler would receive his share and more.

A change, however, was taking place, and the fruits of compulsory education of the working man were the beginning of the struggle between capital and labor. Looking through this new and powerful wide-angle lens many truths and facts which had hitherto existed as a blurred mirage in the dimly lighted mind of the worker had now assumed definite form, and in the morning light of a new day

this pinnacle of awakened thought towered high above the valley mists of ignorance and lethargy of centuries. But, as some irresponsible boy who finds himself suddenly endowed with power to wield a heavy club and proceeds to test his strength on the heads of unsuspecting passers-by, so the working classes, intoxicated with the possibilities of this mighty lever, made unreasonable demands, and the resultant breach between labor and capital widened rapidly until at the present day the two forces were generally diametrically opposed.

Dr. Nieto did not believe that any material advance toward the solution of this great problem could be gained by arbitrary action on either side, but thought that only by standing together as a unit and co-operating in every way would it be possible to give justice to all. Capital could do nothing without Labor, and Labor could not exist without Capital. It was a mutual partnership, in which both partners were entitled to receive an adequate return whether the investment were in brains or money. Every man in the community who was doing an honest day's work in any capacity, was contributing to the welfare of his neighbor, and the day was not far distant when after the worker had by lifetime service given the best that was in him, adequate provision would be made for the winter of his life.

Dr. Nieto thought a readjustment of conditions would occur, but that the transition in this country would be gradual and the result of that growth which takes place in obedience to natural laws.

At the conclusion of his address a rising vote of thanks was tendered Dr. Nieto.

The fifth meeting of the subsection

series, held Friday evening, November 27th, was under the direction of the Gas Department, Mr. E. C. Jones, chief engineer, presiding.

It is a matter of gratification to all "Pacific Service" that the tireless energy of our famous gas engineer in developing the process of gas manufacture has been recognized and rewarded by his election to the presidency of the great national organization, the American Gas Institute. Needless to say, therefore, that Mr. Jones received something in the nature of an ovation when he stepped forward after a brief introduction by Chairman S. V. Walton.

Mr. Jones briefly reviewed the progress of the gas industry and found a reason for the two rival illuminants—gas and electricity—walking hand in hand in this present age of progress and development. He spoke in part as follows:

"While in New York last month the thirty-fifth anniversary of the invention of the incandescent electric lamp by Edison was celebrated on a day set apart and known as Edison Day, and this celebration befittingly commemorated the real beginning of electric lighting by the greatest inventor the world has ever produced.

In 1912 the centenary of the gas business was celebrated in Philadelphia, that being the one hundredth anniversary of the granting of a charter by Parliament to the London and Westminster Gas Light and Coke Company.

"When we compare the work in electricity performed by Brush and his contemporaries with that of Murdoch and Le Bon in the establishment of gas manufacture as a business, and each antedating the substantial beginning of the business by about the same number of years, we find that the gas business of today, when considered by years, is just three times as old as the electric business, and there are few here tonight who do not believe that the electric business has advanced to its present state of perfection three times as fast as the gas business.

In point of years this is true, but the beginning of the gas business was in days not far removed from the time when they were burning witches at the stake in Salem, Mass., and the knowledge of chemistry consisted of the consideration of the four elements: earth, air, fire and water; and even the name given by Van Helmont to what is now known as gas, was "geist," which shows the supernatural and ghostly place that this new discovery took in the minds of men.

"While the world in 1792 was not quite ready for the discoveries of Wm. Murdoch, which required twenty years before they were practically applied, it was far less ready for the wonderful discoveries of electric lighting, the telephone and the talking machine.

"The experiments of Faraday in 1831 laid the foundation for all dynamo-electric machinery, but there was an intervention of forty-eight years before the great mind of Edison invented the incandescent lamp, which converted the investigations of Faraday and the men who followed him into a benefit to all the world.

"Wm. Murdoch, of whom we have heard so much, and who first distilled coal and produced illuminating gas, also did pioneer work in electricity, for in 1799 he invented the "D" slide valve, which was applied to steam engines and gas meters, so that in an indirect way the pioneer of the gas business also did pioneer work in the development of electric machinery. Co-operation and friendliness should exist, and I believe does exist between the gas and electric men of this country."

Following Mr. E. C. Jones came his son, Mr. Leon B. Jones, with an address upon the progress of oil-gas manufacture. Mr. D. E. Keppelmann told us about "Autogenous Welding" and its application to the work of the gas department. So the entire evening was devoted to the exploitation of gas, while electricity, for once, was kept in the background. But it was all for the good of "Pacific Service."

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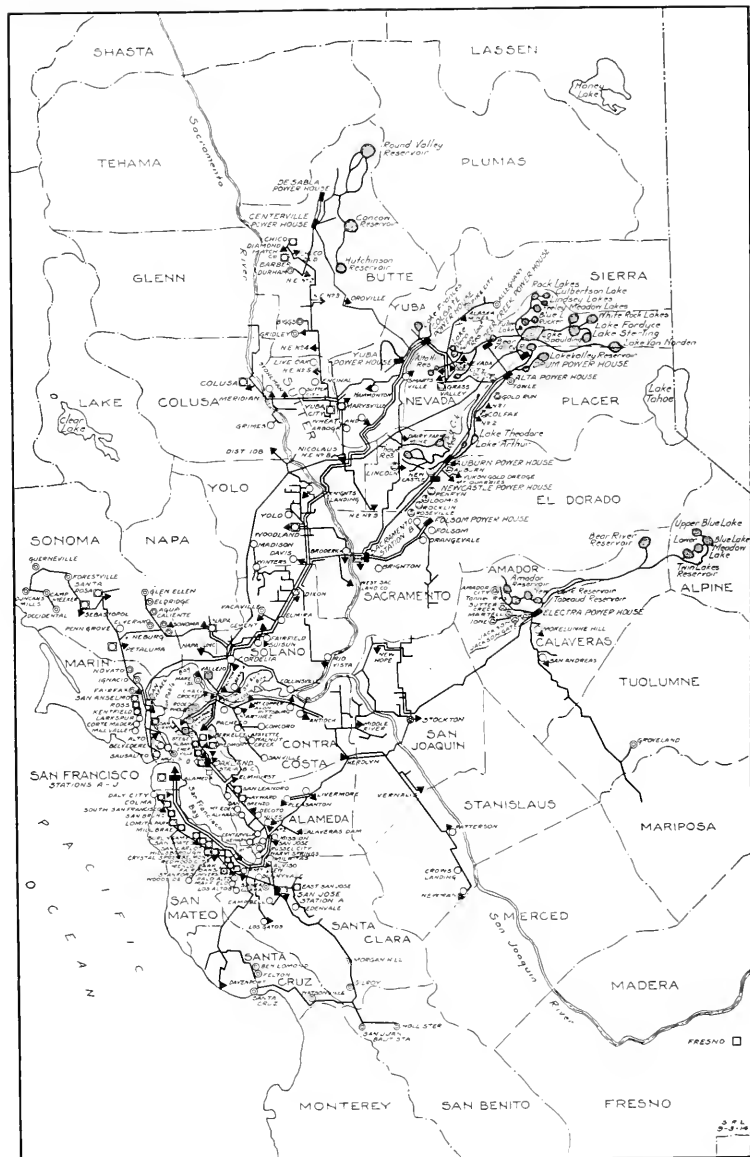
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PACIFIC GAS AND ELECTRIC COMPANY

CITIES AND TOWNS SUPPLIED WITH GAS, ELECTRICITY, WATER AND RAILWAY

SERVICE FURNISHED	NUMBER OF CITIES AND TOWNS SERVED BY COMPANY			TOTAL POPULATION
	DIRECTLY	INDIRECTLY	TOTAL	
Electricity.....	126	49	175	1,220,238
Gas.....	48	2	50	1,125,068
Water (Domestic).....	9	11	20	58,710
Railway.....	1	..	1	75,602

Place	Population	Place	Population	Place	Population
¹ Alameda.....	27,000	⁶⁴ Gold Run.....	100	² Piedmont.....	1,720
² Albany.....	800	⁶⁵ Grass Valley.....	4,500	³ Pike City.....	200
³ Amador City.....	200	⁶⁶ Gridley.....	1,800	⁴ Pinnole.....	1,500
⁴ Allegany.....	200	⁶⁷ Grimes.....	250	⁵ Pittsburg.....	2,372
⁵ Alviso.....	200	⁶⁸ Groveland.....	125	⁶ Pleasanton.....	2,000
⁶ Angel Island.....	280	⁶⁹ Guerneville.....	500	⁷ Port Costa.....	600
⁷ Atherton.....	250	⁷⁰ Hammononton.....	500	⁸ Redwood City.....	3,200
⁸ Auburn.....	2,375	⁷¹ Hawyard.....	4,000	⁹ Richmond.....	10,000
⁹ Agua Caliente.....	100	⁷² Hillsborough.....	1,000	¹⁰ Rio Vista.....	884
¹⁰ Alvarado.....	900	⁷³ Hollister.....	3,000	¹¹ Rocklin.....	1,000
¹¹ Antioch.....	3,000	⁷⁴ Ignacio.....	100	¹² Roseville.....	2,600
¹² Arboga.....	100	⁷⁵ Imperial.....	900	¹³ Rodeo.....	500
¹³ Barber.....	500	⁷⁶ Irvington.....	1,000	¹⁴ Ross.....	500
¹⁴ Belmont.....	350	⁷⁷ Jackson Gate.....	100	¹⁵ Russell City.....	250
¹⁵ Ben Lomond.....	800	⁷⁸ Jackson.....	2,035	¹⁶ Sacramento.....	75,602
¹⁶ Belvedere.....	1,000	⁷⁹ Kentfield.....	250	¹⁷ San Andreas.....	200
¹⁷ Benicia.....	3,360	⁸⁰ Knights Landing.....	350	¹⁸ San Anselmo.....	1,500
¹⁸ Berkeley.....	53,000	⁸¹ Knight's.....	125	¹⁹ San Bruno.....	1,500
¹⁹ Biggs.....	750	⁸² Lafayette.....	100	²⁰ San Carlos.....	100
²⁰ Bollinas.....	500	⁸³ Live Oak.....	200	²¹ San Francisco.....	530,000
²¹ Brighton.....	100	⁸⁴ Livermore.....	2,250	²² San Jose.....	37,946
²² Broderick.....	200	⁸⁵ Los Gatos.....	3,000	²³ San Leandro.....	4,000
²³ Burlingame.....	4,300	⁸⁶ Larkspur.....	600	²⁴ San Lorenzo.....	100
²⁴ Camp Meeker.....	100	⁸⁷ Lincoln.....	1,400	²⁵ San Mateo.....	6,500
²⁵ Campbell.....	600	⁸⁸ Lomita Park.....	100	²⁶ San Quentin.....	2,500
²⁶ Centerville.....	20	⁸⁹ Los Altos.....	500	²⁷ San Rafael.....	6,000
²⁷ Chico.....	13,000	⁹⁰ Loomis.....	150	²⁸ San Pablo.....	1,000
²⁸ Colinsville.....	150	⁹¹ Madison.....	250	²⁹ Santa Clara.....	6,000
²⁹ Colma.....	3,500	⁹² Madrone.....	125	³⁰ Santa Cruz.....	16,000
³⁰ Colusa.....	1,500	⁹³ Martinez.....	5,000	³¹ Santa Rosa.....	10,500
³¹ Concord.....	1,500	⁹⁴ Martell.....	150	³² Sebastopol.....	1,200
³² Cement.....	1,500	⁹⁵ Marysville.....	7,000	³³ Sausalito.....	2,500
³³ Colfax.....	500	⁹⁶ Mayfield.....	1,500	³⁴ Sheridan.....	130
³⁴ Cordelia.....	150	⁹⁷ Menlo Park.....	1,500	³⁵ Smartsville.....	500
³⁵ Corte Madera.....	350	⁹⁸ Meridian.....	300	³⁶ South San Francisco.....	2,500
³⁶ Crockett.....	2,500	⁹⁹ Millbrae.....	300	³⁷ Stanford University.....	2,600
³⁷ Crow's Landing.....	375	¹⁰⁰ Milpitas.....	300	³⁸ Sonoma.....	1,300
³⁸ Daly City.....	250	¹⁰¹ Mill Valley.....	2,500	³⁹ Stege.....	1,000
³⁹ Danville.....	250	¹⁰² Mission San Jose.....	500	⁴⁰ Stockton.....	35,000
⁴⁰ Davis.....	750	¹⁰³ Mokelumne Hill.....	250	⁴¹ Suisun.....	1,200
⁴¹ Decoto.....	350	¹⁰⁴ Morgan Hill.....	500	⁴² Sutter City.....	150
⁴² Dixon.....	1,000	¹⁰⁵ Mountain View.....	2,500	⁴³ Sutter Creek.....	1,500
⁴³ Davenport.....	1,000	¹⁰⁶ Mt. Eden.....	200	⁴⁴ Sunnyvale.....	1,500
⁴⁴ Durham.....	500	¹⁰⁷ Mare Island.....	500	⁴⁵ Tiburon.....	400
⁴⁵ Dutch Flat.....	500	¹⁰⁸ Napa.....	7,500	⁴⁶ Towle.....	100
⁴⁶ Duncan's Mills.....	150	¹⁰⁹ Nevada City.....	2,700	⁴⁷ Vacaville.....	1,200
⁴⁷ Edenvale.....	500	¹¹⁰ Newark.....	700	⁴⁸ Vallejo.....	13,600
⁴⁸ Eldridge.....	500	¹¹¹ Newcastle.....	750	⁴⁹ Vineburg.....	200
⁴⁹ Elmira.....	150	¹¹² Newman.....	1,600	⁵⁰ Walnut Creek.....	350
⁵⁰ El Verano.....	400	¹¹³ Niles.....	800	⁵¹ Warm Springs.....	200
⁵¹ Emeryville.....	5,000	¹¹⁴ Novato.....	250	⁵² Watsonville.....	4,500
⁵² Encinal.....	100	¹¹⁵ Oakland.....	215,000	⁵³ Wheatland.....	1,400
⁵³ Fairfax.....	500	¹¹⁶ Occidental.....	400	⁵⁴ Woodland.....	1,200
⁵⁴ Fairfield.....	834	¹¹⁷ Orange Vale.....	100	⁵⁵ Woodland.....	5,500
⁵⁵ Forestville.....	100	¹¹⁸ Palo Alto.....	6,300	⁵⁶ Woodside.....	200
⁵⁶ Felton.....	300	¹¹⁹ Pacheco.....	200	⁵⁷ Yolo.....	450
⁵⁷ Fresno.....	40,000	¹²⁰ Perry.....	500	⁵⁸ Yuba City.....	1,200
⁵⁸ Folsom.....	1,800	¹²¹ Patterson.....	300		
⁵⁹ Gilroy.....	2,000	¹²² Penn Grove.....	300		
⁶⁰ Glen Ellen.....	500	¹²³ Petaluma.....	5,500		

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GOOD SERVICE AT FAIR RATES

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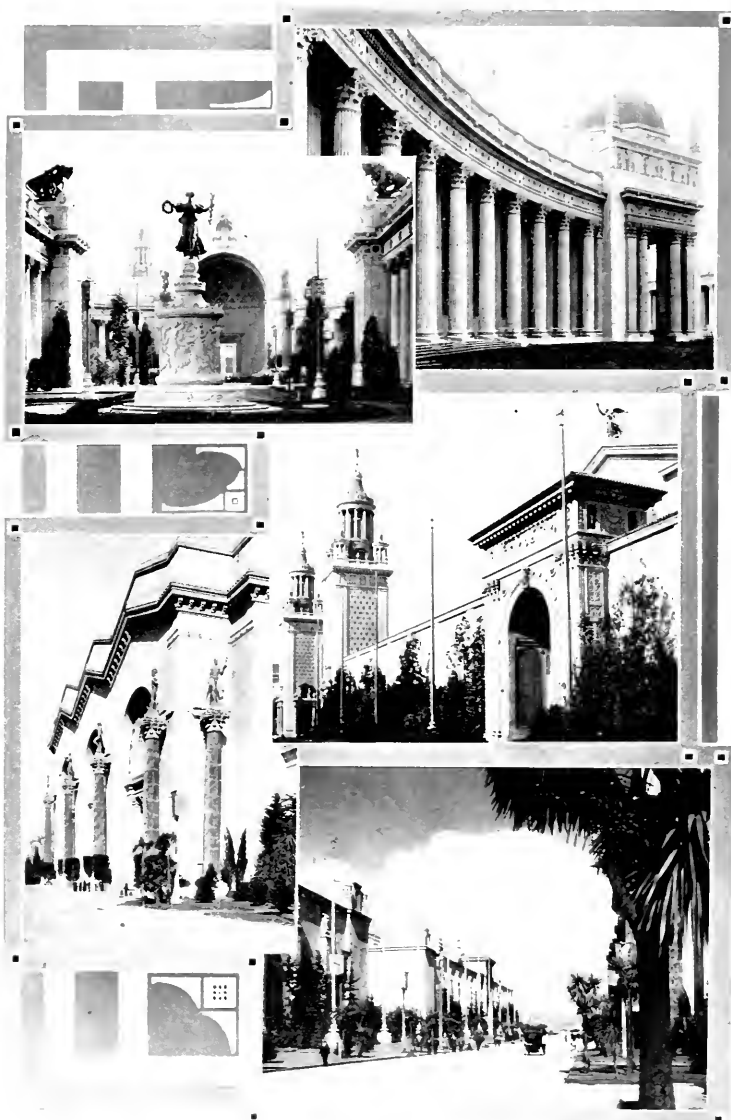
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Contents for January

ARCHITECTURAL FEATURES OF PANAMA-PACIFIC EXPOSITION	<i>Frontispiece</i>
THE COLLECTIVE GAS EXHIBIT AT THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION	<i>E. C. Jones 255</i>
CODE OF PRINCIPLES FOR PUBLIC UTILITIES—ADOPTED BY THE AMERICAN ELECTRIC RAILWAY ASSOCIATION	<i>260</i>
GAS AN IMPORTANT FACTOR IN THE SUCCESS OF THE EXPOSITION	<i>D. E. Keppelmann 261</i>
THE JAMES HUGH WISE LIBRARY	<i>J. P. B. 265</i>
PILE-DRIVING A PART OF POLE-LINE CONSTRUCTION IN MARSHY TERRITORY	<i>C. E. Young 266</i>
SAFETY FIRST!—A MESSAGE FROM THE COMMITTEE	<i>269</i>
IN MEMORIAM—WILLIAM ROBERT ECKART	<i>George W. Dickie 270</i>
ITEMS FROM WOMEN OF THE COMPANY	<i>276</i>
DOINGS OF "PACIFIC SERVICE" SECTION, N. E. L. A.	<i>E. B. Price 278</i>
IN MEMORIAM—JOHN W. TERNEY	<i>279</i>
EDITORIAL	<i>280</i>
TIDINGS FROM TERRITORIAL DISTRICTS	<i>282</i>

Index to Advertisers

Allis Chalmers Mfg. Co.	ii	Pierson, Roeding & Co.	vi
Associated Oil Co.	iii	Roebbing's, John A., Sons Co.	v
Bonbright, William P., & Co.	i	Schaw-Batcher Co.	viii
Byron Jackson Iron Works.	vii	Sprague Meter Co.	iii
Chaplin-Fulton Mfg. Co.	vii	Standard Underground Cable Co.	vii
General Electric Co.	ix	Steiger & Kerr Stove & Foundry Co.	vi
General Gas Light Co.	ii	Wagner Electric	vii
Halsey, N. W., & Co.	4th page cover	Western Engineering Publishing Co.	iii
John-Manville, H. W., Co.	v	Westinghouse Electric & Mfg. Co.	x
Pacific Telephone & Telegraph Co.	2d page cover	Welsbach Company	iv
Patrick & Co.	viii	White, J. G., Engineering Corporation	2d page cover
Pelton Water Wheel Co.	viii	Wood, R. D., & Co.	v



Architectural features of the Panama-Pacific Exposition. Reading from the top, left to right: Court of the Four Seasons; colonnades, Court of the Universe; facade, Palace of Machinery; Palace of Liberal Arts, with towers, at entrance to Court of Palms; Avenue of Progress, showing Palace of Mines.

The Collective Gas Exhibit at the Panama-Pacific International Exposition

By E. C. JONES

GAS has now taken its place among human necessities, and through the efforts of the earnest workers in the gas business the price of this commodity is now universally so low that, if properly used, it has no successful competitors in the fields of heating and illumination.

The gas industry has forged ahead in importance until it is now in the front rank of public utilities; probably second only in importance to the great railroad systems of the world.

Features of great industrial expositions usually include a transportation building in which the development of railroads is exemplified by expensive and elaborate exhibits, and electric palaces bringing out the strides made in the science of electricity; but at none of these expositions has the gas industry taken the place which its importance warranted.

At Chicago in 1893 it was attempted to have a representative exhibit of the gas industry, but it has been said that the failure of the attempt was due to the prevailing conservatism among gas men. It was probably due to lack of concerted effort, and the failure of 1893 led to the success of the gas exhibit at the Louisiana Purchase Exposition in St. Louis in 1904.

The lack of general knowledge of the scope and importance of the gas industry is shown by the treatment it has received at the hands of those whose duty it has been to prepare a suitable classification of the awards for exhibitors. At St. Louis the original classification included the gas industry in group No. 49, which covered "Appliances and Methods Not Elec-

tric, for Lighting." This group also included Japanese and Chinese lanterns, matches, acetylene generators, lamps, lamp chimneys, wicks and smoke consumers. Under this broad and indefinite grouping no gas exhibit could hope for deserved recognition or award.

This probably unintentional slighting of the gas business, however, was one of the best things that ever happened to the industry, as it awakened the gas men of the country and stimulated them to demand recognition of so important a business. The credit of having started this good work is due to Mr. O. N. Guldlin of Fort Wayne, Ind. Through his earnest work a new classification was prepared under the heading, "Apparatus and Process for the Manufacture, Purification and Distribution of Gas for Fuel and Lighting and Recovery of By-Products," and prominent gas men of the country were selected as jurors. This organization was known as the American Representatives of Group Jury No. 49 of Jury No. 2, Palace of Manufactures, and consisted of Messrs. O. O. Thwing, Paul Doty, W. A. Bachr, Thomas D. Miller, J. M. Morehead, and one on Group Jury No. 26, Palace of Liberal Arts covering the exhibit of the Western Gas Association, Mr. E. G. Cowdery.

The work of these men in conjunction with Mr. Guldlin secured proper recognition of the gas industry and justice and fairness in the awards for meritorious exhibits. The classification prepared by this committee appears in full on page 643 of the Proceedings of the Western Gas Association for 1905 as part of a paper



The Palace of Manufactures, showing entrance fronting on the great South Garden.

prepared by Mr. Guldlin entitled, "Experiences as an Exhibitor at the World's Fair."

This classification was afterwards generally adopted by the gas associations of the United States as a model for classifying future gas exhibits, and at the annual meeting of the American Gas Institute in 1912 a Committee on Classification of Awards for the Panama-Pacific International Exposition was appointed, consisting of the seven men who had done such splendid work at St. Louis, with the name of E. C. Jones added to this number.

It was hoped that the Exposition authorities would adopt the classification covering the gas industry which had finally proven so satisfactory at St. Louis, but it was thought that the plan and scope of the official classification would not permit of the adoption of so extensive a cataloguing of the gas industry, and the original St. Louis classification was tentatively adopted. On being shown that un-

der this classification it would be impossible to induce manufacturers to exhibit, it was agreed that a new classification should be prepared of a length in keeping with the classification of other industries, and this appears on page 26 of the official classification of exhibits departments as follows:

GROUP 70.

MANUFACTURE, DISTRIBUTION AND USES OF GAS FOR LIGHT AND FUEL.

Class 353. Manufacture of Gas: Processes and apparatus for manufacturing gas from coal; processes and apparatus for manufacturing water gas; processes and apparatus for manufacturing oil gas; apparatus and materials for the physical and chemical cleansing of gas; apparatus for testing crude materials and manufactured gas.

Class 354. Distribution of gas: Pipe, pipe fittings, valves, pressure-regulating apparatus; tools used in laying mains or services; meters and gas measuring apparatus; appliances for the transmission of gas, including exhausters and compressors.

Class 355. Uses of Gas: Incandescent

gas lamps and mantles, gas burners, and appliances for gas lighting; appliances for cooking by gas; appliances for heating by gas, including water heaters and hot air furnaces; appliances for utilizing gas for industrial purposes.

While this classification seemed to cover any possible exhibits of the industry, it did not meet with the entire approval of the committee of the American Gas Institute, and it became the work of the committee to prepare a new classification of sufficient length and scope to include the essentials of that adopted at St. Louis, and, also, to cover the growth and expansion of the gas industry during the eleven years intervening between the St. Louis and San Francisco expositions.

The classification prepared by this committee was adopted by the American Gas Institute at its meeting in Richmond, Virginia, in 1913, as follows:

GROUP 70.

MANUFACTURE, DISTRIBUTION AND USES OF GAS FOR LIGHT AND FUEL.

Class 353. Manufacture of Gas.

A. Coal Gas: Retort, design and material.

Horizontal retort benches:

- (1) Setting and retorts for same.
- (2) Furnaces and heating for same.
- (3) Charging and discharging apparatus for same.
- (4) Apparatus for closures for retorts.

Inclined retort benches:

- (1) Setting and retorts for same.
- (2) Furnaces and heating for same.
- (3) Charging and discharging apparatus for same.
- (4) Apparatus for closures for retorts.

Vertical retort benches:

- (1) Setting and retorts for same.
- (2) Furnaces and heating for same.
- (3) Charging and discharging apparatus for same.
- (4) Apparatus for closures for retorts.

Apparatus for distilling of coal gas in chamber ovens:

- (1) Types of construction.
- (2) Furnaces and heating for same.
- (3) Charging and discharging for same.
- (4) Apparatus for closures for same.

Apparatus used in manufacture of coal gas for:

- (1) Gas off take.
- (2) Tar off take.
- (3) Tar extraction.
- (4) Ammonia extraction.
- (5) Extraction of sulphur compounds.

B. Water Gas: Generating apparatus; special appliances for calibration, measurement, regulation and operation, safety devices.

C. By-Product Gas: Coke oven settings; furnaces and mountings; operating tools, machines and equipment.

D. Oil Gas: Generating apparatus; appliances for operating.

E. Works Specials and Valves: To include center seals for purifiers.

F. Cleaning and Purification: Apparatus, material and processes for removal of tar; for removal of lampblack; for recovery of ammonia; for recovery of ben-



Projected facade of the Collective Gas Exhibit in the Palace of Manufactures.

zol; for recovery of cyanogen; for removal of sulphur compounds.

G. Treatment of By-Products: Ammonia concentrators; apparatus for manufacture of ammonium sulphate; for manufacture of hydrated ammonia; tar stills; benzol separators; sulphur and cyanide recovery apparatus.

H. Exhausters and Blowers: Pumping apparatus.

I. Instruments and Appliances for Measuring Gas and Testing Crude Materials, Manufactured Gas: Photometers, calorimeters; pyrometers; gauges; meters; analytical apparatus.

K. Gas Making Materials: Gas coals; gas cokes; gas oils.

Class 354. Distribution of Gas.

A. Gas Holders and Special Holder Equipment.

B. Gas Mains and Auxiliaries: Cast iron pipe, valves and specials; steel and wrought iron pipe, valves and fittings, pipe joints; apparatus and tools for handling and laying pipe; trenching machinery and tools; safety appliances; main stoppers and bags; electrolysis prevention; leak detectors; safety helmets; devices for treatment of asphyxiation; compressors and pressure boosters; pressure regulators and governors; gauges and recorders; maps and records.

C. Gas Services and Auxiliaries: Service pipe and fittings; gas taps; tools and appliances for laying and maintaining services; consumers' meters; service regulators; appliances and methods for distributing compressed and liquified gas; report and record forms.

Class 355. Uses of Gas.

A. Lighting Appliances and Apparatus: Incandescent burners and mantles; multiple mantle gas burners; gas fixtures; appliances for lighting, extinguishing and regulating gas lamps and burners; lamps and equipment for street lighting; street and window advertising with gas.

B. Fuel Appliances and Apparatus: Gas stoves; gas ranges; appliances for cooking and domestic purposes; apparatus and appliances for heating, ventilation and sanitation.

C. Water Heaters: Tank heaters; instantaneous; automatic.

D. Industrial Appliances and Apparatus: Gas furnaces; gas ovens; gas kilns; gas forges; gas fuel appliances not otherwise specified.

This classification was submitted to the officials of the Panama-Pacific International Exposition Company and was acknowledged in the following letter:

SAN FRANCISCO, March 12, 1914.
MR. E. C. JONES,

445 Sutter Street, San Francisco, Cal.

Dear Sir:—I have the honor to acknowledge the receipt of a copy of the docu-

ment approved by the Committee on Classification of Awards of the Panama-Pacific International Exposition appointed at the 1912 Convention of the American Gas Institute for the purpose of securing adequate representation of the gas industry at this Exposition.

While I do not approach this subject in a technical way, it is quite apparent to me that such an amplification of the classification if published by the Exposition and certified to by you, if carried out to a similar extent in other classifications of industries, would make a most bulky and unwieldy document.

However, your extended and more detailed analysis will be submitted and certified up to the International Jury of Awards, and this may serve your purpose just as well as the incorporation of the entire matter in our classification which would require the issue of another edition.

I hope this statement will satisfy your committee and that the industry will make a complete and educational showing at this Exposition.

Very truly yours,

(Signed) A. C. BAKER,

Director of Exhibits.

This places the gas industry on a sound basis at the Panama-Pacific International Exposition, and at the Gas Institute meeting, held in New York, in 1914, the work of the committee was accepted and the committee discharged.

At the annual dinner of the Classification Committee held at the Lotus Club on Wednesday evening, October 21, 1914, one of the members remarked that the classification was very satisfactory, but that he did not see the use of a classification unless there was to be an exhibit of gas appliances at the Panama-Pacific Exposition. It was the opinion of the committee that there should be a representative gas exhibit, and the old classification committee as a whole was appointed a committee on Collective Gas Exhibit for the Panama-Pacific Exposition.

The word "collective" as a part of the title means that every article used in the manufacture, distribution and use of gas shall be included in one exhibit pavilion. This was impossible at Chicago and St. Louis and will be a unique feature at San Francisco.



Floor plan of the Collective Gas Exhibit in the Palace of Manufactures.

The committee immediately took steps to ascertain the feelings of gas appliance manufacturers toward exhibiting at San Francisco, and finding it favorable immediately reserved space in the Palace of Manufactures and started a campaign for securing exhibits. Ten thousand square feet of space was secured in the most desirable corner of one of the finest of the Exposition palaces. A design of a pavilion with floor plan including sixty-one spaces for exhibitors was prepared, and it soon became evident that every inch of space would be taken.

For the purpose of co-operative work between the East and the West a meeting of the Pacific Coast Gas Association was held at the Engineers' Club, San Francisco, on the evening of November 18, 1914. At this meeting the work of the Eastern committee was enthusiastically approved, and the association appointed the following as a committee to carry on the work in San Francisco:

Frank A. Cressey, Jr., Chairman; Frank A. Leach, Jr., Secretary; D. E. Keppelmann, F. C. Millard, C. B. Babcock, R. J. Thompson, W. F. Boardman, H. R. Bas-

ford, B. S. Pedersen, H. P. Pitts, Paul Haugh, John B. Redd, E. C. Jones.

Mr. John B. Redd of San Francisco, connected with the Industrial Department of the Pacific Gas and Electric Company, was considered the best man to take charge of the exhibit, and care for the interest of the exhibitors and the gas industry, and he was appointed superintendent to devote his time to the making of an unparalleled success of the Collective Gas Exhibit. The committees have contracted for the erection of one of the finest pavilions in the Palace of Manufactures at a cost of \$13,100, and a contract has also been let for gas piping for the pavilion. This will be completed February 1, 1915, ready for the display of exhibits, and under this one roof will be assembled a gas industry exhibit representing every branch of the business.

It is proposed to have the pavilion illuminated by gas in the most modern and artistic way, and through the kindness of the Welsbach Company and the General Gas Light Company, who share the work, this will be done in a manner that will attract the attention of the

world to the brilliancy, efficiency and economy of gas lighting.

Exhibits are beginning to arrive from the East and are being cared for by the superintendent, and the committees of the East and West have full confidence that on the opening day of the Panama-Pacific Exposition, February 20, 1915, the Collective Gas Exhibit will be complete, and will be a credit to the industry which we have all striven so hard to advance.

The gas industry owes much to the members of the Institute Committee, and, particularly, to Mr. E. G. Cowdery, its chairman, for their tireless and unselfish work devoted to placing the gas business in its proper setting with the other great industries of the world at the Panama-Pacific Exposition.

To quote Mr. Guldlin, "The seed sown in St. Louis is now ripening for harvest."



Code of Principles for Public Utilities

Adopted by the American Electric Railway Association at Atlantic City, N. J., on October 14, 1914

I.—The first obligation of public utilities engaged in transportation is service to the public. The first essential of service is safety. Quality of service must primarily depend upon the money received in fares. For this reason it is necessary that the rate of fare should be sufficient to permit the companies to meet the reasonable demands of patrons and to yield a fair return on a fair capitalization.

II.—Regulated private ownership and operation of electric railways is more conducive to good service and the public welfare than government ownership and operation because the latter are incompatible with administrative initiative, economy and efficiency, and with the proper development of cities through the extension of transportation lines. The interests of the public are fully protected by the authority given to regulatory bodies.

III.—In the interest of the public and good service local transportation should be a monopoly and should be subject to regulation and protection by the state rather than by local authorities.

IV.—Short-term franchises are detrimental to civic welfare and growth because they ultimately check the extension of facilities and discourage good service.

V.—In order to render good service, electric railways must be allowed to earn a fair return on a fair capitalization, and

the foundation for this result will be obtained if the issuance and sale of securities representing such fair capitalization shall be legally authorized on such terms as will produce the requisite funds.

VI.—Securities which have been issued in accordance with the law as it has been interpreted in the past should be valid obligations on which an electric railway is entitled to a fair return.

VII.—The relation of adequate wages to efficient operation should always be recognized, but electric railways, being public servants regulated by public authorities, should be protected against excessive demands of labor and strikes.

VIII.—The principle of ownership of securities of local companies by centralized holding companies is economically sound for the reason that the securities of the latter have protection against the varying business conditions of a single locality or company and because money for construction and improvements can thus be more readily obtained.

IX.—In the appraisal of an electric railway for the purpose of determining reasonable rates, all methods of valuation should have due consideration.

X.—Full and frank publicity should be the policy of all transportation companies, to the end that proper information may be available to the investor and the public.

Gas An Important Factor in the Success of the Exposition

By D. E. KEPPELMANN, General Superintendent, Gas Distribution

GAS is to be an important as well as a versatile factor in the success of the Exposition. It will be used not only for lighting, but, also, for heating to

sure of forty pounds to the square inch will be delivered from the 16-inch high-pressure main artery, which extends from the Potrero Gas Works, located at

the south end of the city, almost around San Francisco to the North Beach holder station, connecting with an 8-inch continuous steel loop, which practically surrounds the Exposition site. This loop entirely eliminates what are generally known as "dead ends," thereby insuring perfect circulation.

Extending from the 8-inch loop is a 4-inch loop surrounding the foreign

and states' sites, another 4-inch loop surrounding the amusement concessions and a 2-inch loop along the Marina Esplanade, in all consisting of upwards of one hundred thousand feet of welded steel mains.

Gas is delivered to the great palaces by means of 3-inch services welded to the mains, where a district governor is in-

drive the chill from the great palaces at night, and for feeding the many thousands that may crave food, from hot bouillon to a table d'hôte dinner; added to these will be its part in the spectacular light effects that are to transform the various great courts into a veritable fairyland.

High-pressure gas will be used exclusively, and will be supplied by the Pacific Gas and Electric Company, a fitting tribute to its Vice-President and General Manager, Mr. John A. Britton, the "Father of high-pressure gas," and to its Chief Engineer, Mr. E. C. Jones, for his development of oil-gas manufacture and the newer methods of gas distribution.

Gas at a minimum pres-



Fig. 1



Fig. 2

stalled reducing the high-pressure gas to a working pressure of from 4 to 6 inches, thence connected to the piping in the buildings. The same plan of distribution is adhered to in all the larger buildings, wherein are installed 4 and 6-inch loops, from which services are connected to supply each individual consumer. In the concessions territory, services are installed direct to each consumer, with individual house regulators connected to each meter, thereby reducing the gas to a pressure necessary to give the best results for the particular purpose for which the gas is to be used.

Since gas will be sold directly to the Exposition Company, this necessitated the installation of apparatus for the measurement of high-pressure gas; therefore, it was decided to install two Thomas electric meters, one for the main site and the other for the concessions territory. The meter depends for its operation upon the principle of heating the gas electrically through a fixed range of temperature as it flows through a passage, and measuring the quantity of electrical energy required to produce this rise in temperature. The cast-iron housings will be located in the main line in street pits,



Fig. 3

while the recording panels will be housed in a small building conveniently erected nearby for observation purposes.

Having in mind the necessity of an adequate supply of gas for the Exposition at all times, as well as eliminating the dangerous factor of a supply from one source only, Mr. E. C. Jones, the company's chief engineer, conceived a new installation, and the management has authorized the extension of 8,000 feet of 16-inch main, connecting the present high-pressure 16-inch main artery with the Metropolitan Gas Works, located at North Beach, in the northerly end of the city. This installation is welded throughout by the oxy-acetylene process, already made famous by "Pacific Service," thereby eliminating all joints, creating a continuous steel main without leaks.

Some idea of the plan and scope of the work may be conceived from a study of the accompanying illustrations.

Figure 1 shows six lengths of 16-inch pipe, each 20 feet long, welded together, a total weight of 6,000 pounds, about to be lowered into the trench.

Figure 2 shows the first test applied to a welded joint, a length of 16-inch pipe, weighing 1,000 pounds, hanging on its weld; after which the



Fig. 4



Fig. 5

various sections are lowered into the trench, welded together and a test with air compressed to 100 pounds to the square inch is applied.

Figure 3 shows the operators welding sections of 16-inch pipe together. Formerly couplings with rubber and other gaskets were used to couple the lengths together, which, however, due to the disintegration of the gasket causing leaks, proved a very unsatisfactory joint. The welded joint has overcome all the difficulties, eliminating leaks, and is installed at considerably less cost than former methods.

Figure 4 shows the operator in the trench welding together the great sections. Lengths are welded into sections, after which the sections are lowered into the trench and then welded together.

Figure 5 shows the inestimable value of a welding outfit. An obstruction in the form of a 3-inch gas service occurred at this point. In order to drop the section into the trench it was necessary to temporarily stop the supply of gas and cut off the service. Heretofore a fitter and helper were required to cut with pipe cutters and, later, thread the pipe and connect together with a running

screw. The present practice permits of cutting the pipe with the oxy-acetylene flame and after the section of large pipe is lowered into the trench, the smaller pipe is again welded into position. Material and labor necessary under former methods would approximate \$5.00, while with our welding process they would cost approximately \$1.00, and with

considerably less inconvenience to the consumer, since little time is required when gas may again be turned on.

Figure 6 shows the elimination of special fittings required under former practice. Large obstructions and interferences occur frequently, necessitating a deviation from the predetermined course; requiring special fittings. Heretofore these specials necessitated plans, patterns and castings, occasioned disappointments in deliveries and then invariably leaked, causing delays and higher costs. Present practice requires no preliminary surveys for specials, for with a welding outfit, when interferences occur, the same pipe is merely deflected around the obstruction and welded, eliminating delays and leaks and installed at considerably less cost.

Figure 7 shows more clearly a type of



Fig. 6

interference in the form of an 18-inch water main, with the gas main deflected and installed beneath the water main.

Figure 8 shows the reverse view of Figure 7, the deflected pipe being welded to the existing main line. No more comprehensive idea could be given the all-round advantage of welding steel mains with the oxy-acetylene process. With no limitations, together with the elimination of leaks, at practically half the first cost,



Fig. 8

and no maintenance, it creates the ideal installation and solves the problem that has been a bugbear to the gas fraternity for years.

Figure 9 shows a welded drip. In high-pressure gas-mains drip-pots are as essential as in low-pressure mains, requiring the installation of drips at low points to collect the accumulation of condensation. Formerly specially cast drip-pots with insufficient capacity and at great cost were installed. Present practice permits of weld-



Fig. 7

ing two lengths of pipe together, providing any capacity desired, and welded into the main line.

Gas will be an important factor in lighting part of the Exposition. The latest installation of high-pressure gas lamps, such as are used in Paris, London and Berlin, will be installed on Marina Esplanade and on the foreign and states' sites. These burn with a pressure of $2\frac{3}{4}$ pounds applied directly to the mantle, insuring the greatest lighting effici-

ency. Gas lighting will also be employed for patrol purposes, the Exposition being so thoroughly equipped with gas ares and



Fig. 9



Fig. 10

lamps that a complete suspension of electric power would leave the grounds will lighted.

Figure 10 shows a view of the States avenue, with a number of the high pres-

sure gas lamps installed, giving a general idea of the lamp in detail. It will be observed that it is both artistic and ornamental by day, while providing the maximum efficiency in lighting by night.



"MEDICINE FOR THE MIND."

The month of December was an exceptionally busy one for the library's shelves. The month opened with a Christmas gift from Mr. J. H. Pryce of Martin station, who gave nine complete bound volumes of the *Ridpaths History of the World*.

Mr. F. W. Brown of the Drafting Department gave a volume on "Electricity and Magnetism" by Nichols & Franklin.

Mr. S. E. Carpenter of the Civil Engineering Department presented a bound copy of "Electric Power Transmission" by Bell.

Mr. J. D. Keller of Sacramento District donated an Engineer's Reference Book of 1856 by Templeton.

The Canadian Geological Survey of Canada sent several interesting treatises on mining subjects.

Mr. W. B. Mel gave complete bound volumes of *Power and Engineer* Nos. 28, 29, 30, 31.

The U. S. Geological Survey sent several dozen interesting pamphlets on mineralogical subjects.

Mrs. Clara B. Wise just before the Christmas holidays gave the principal section of her personal library as a gift to the library; the collection consisted of 20 books on literature and education; 33 novels, 50 on religion, 52 miscellaneous, and 75 pamphlets.

The total number of books on file at the first of the year was 768; pamphlets, 2760.

Pile-Driving a Part of Pole-Line Construction in Marshy Territory

By C. E. YOUNG, O., and M. Department, Hydroelectric Section

IN December, 1912, the Pacific Gas and Electric Company began the construction of an 11 Kv. distribution line through what is generally known as the Suisun marshes for the purpose of furnishing electric service to a suction dredge on Van Sickle island, engaged in filling along the line of the Oakland, Antioch and Eastern Railway for the track foundation across the swamps of Chippis and Van Sickle islands; also, to supply service to the town of Collinsville, on the Sacramento river, at a point near where its waters join those of the San Joaquin.

The line began at the company's Cordelia substation, crossed the Suisun marshes, Joice island, Grizzly island, Van Sickle island and into Collinsville, a distance of approximately nineteen miles, sixteen of which was across marsh and tule land.

It was a difficult task to handle the 50-foot cedar poles and other material used in construction, on account of the boggy nature of the soil. The supporting of the poles was the most difficult task, mud sills being used. Before the line was put in service, however, a storm blew down about three miles of poles. These poles were replaced and the line was completed and put in service during February, 1913. The remainder of the winter and following spring were mild and no further trouble was experienced, but during the storms of January, 1914, about three miles of the line was again blown down, with several additional miles of



C. E. Young

line left in such a condition that it had to be practically rebuilt or, at least, the poles reset.

About the time the dredger above mentioned ceased operations, farmers on the islands began disposing of their gasoline pumping plants used in connection with their reclamation work and installed electric-driven pumps in their place, accordingly, constant service was required. The high water caused by the storms broke over some of the levees, causing sections of the islands to be flooded, while other sections were in danger, and on account of the barley already sown the farmers were exceedingly anxious to keep the pumping plants in operation. Great anxiety was felt as soon as the power went off the line and immediate steps were taken to restore service, temporarily at least. Along the sections where the line was down the water was from six inches to many feet in depth. Launches, boats, rafts, etc., were brought into service, and after two days and nights the line was put into service and in time to save the crops. It might be mentioned at this time that but few of the men employed on the job escaped the usual ducking connected with such work. Some were unfortunate enough to go in all over.

The writer had occasion to be on the job, and saw that before another winter something must be done to prevent a recurrence of the trouble. After some thought it was decided to experiment with a pile-driver by driving a pile beside each pole. The equipment required for the



Winch and engine.

of the circulating pump furnished with it, the water being pumped through the cylinder jacket and returned to the barrel from which it was drawn over a screen used for cooling purposes. Twenty gallons of water was plenty for a nine-hour run on the warmest days.

Two 6x6-inch Oregon pine timbers were used to support the machines and driver guides. Runners 3x12 inches were bolted to the bottoms of these timbers to prevent them from wearing. The foundation frame was 16 feet 2½ inches long,

1 foot 6 inches wide in front and 6 feet wide in the back, height of driver leads overall 28 feet 10 inches, and besides the back braces side braces were hinged to the leads so that they could be swung in any position required; and when the apparatus was being moved the



Starting the pile.

work had to be light, so it could be dragged over the marsh-land, across grain fields and sloughs and could be loaded and unloaded from wagon and barge by the same motive power that was used for raising the driver hammer. A team was out of the question.



Pile-driver moving ahead.

Illustrations herewith shown will give a good idea of what was finally worked out and proved successful. The hoisting equipment consisted of a 5.5 H. P. Standard reversible single-cylinder gas-engine with a 500-pound fly wheel. The engine was belt-connected to a Mead & Morrison hoist provided with two drums with necessary controls, etc. One drum was used for hoisting the hammer and piles, the other for moving ahead. A "gypsy head" on the end of the latter drum was used for moving backwards, dragging piles, etc. The engine was cooled by means

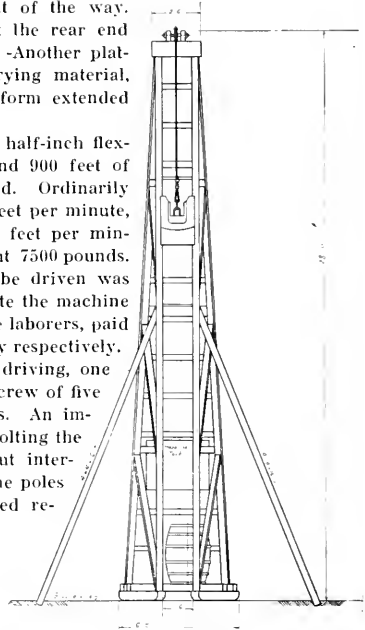


The pile driven 19 feet under ground.

side braces were hooked to the side out of the way. A tool-rack or platform was extended at the rear end and on the side opposite the hoist levers. -Another platform was extended for the use of carrying material, etc., while the engineer had a small platform extended on the lever side also.

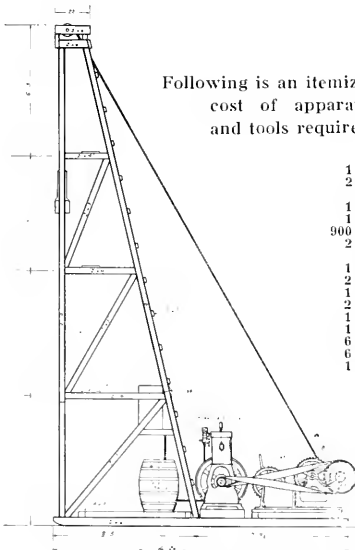
The hammer weighed 1100 pounds. A half-inch flexible steel cable was used on the hoist and 900 feet of similar cable was used for moving ahead. Ordinarily the hammer was raised at the rate of 50 feet per minute, and when moving the driver traveled 25 feet per minute. The machine complete weighed about 7500 pounds. The maximum length of pile that could be driven was 25 feet. Five men were required to operate the machine successfully, a foreman, engineer and three laborers, paid at the rate of \$5.00, \$3.00 and \$2.50 per day respectively.

With no sloughs to cross and straight driving, one pile to each pole, poles 352 feet apart, the crew of five could average 5 piles per day of 9 hours. An important feature was that the driving and bolting the poles to the piles was carried on without interrupting service on the line except when the poles were down or leaning badly and required replacing.



Front plan of pile-driver.

Following is an itemized cost of apparatus and tools required:

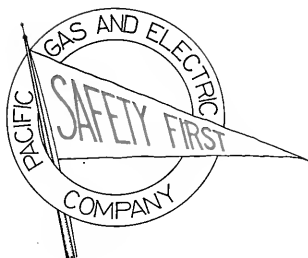


Side elevation of pile-driver.

1 Pile driver and parts.....	\$168.30
2 Mead & Morrison double drum hoist and cable	180.00
1 Gas Engine	127.40
1 40-gallon gasoline tank.....	5.00
900 ft. 1/2-inch flexible steel cable.....	50.00
2 6-inch Met. bushed wire rope steel snatch blocks	13.20
1 8-inch snatch block	1.72
2 8-inch double blocks	2.24
1 10-inch snatch block	2.82
2 12-inch monkey wrenches.....	1.17
1 26-inch hand saw .....	.50
1 Hand axe .....	.70
6 1/2-inch Crosby clamps	1.02
6 1/2-inch Crosby clamps .....	.94
1 Champion screw driver.....	.40

\$555.41

Along portions of the line one pile was driven at each pole but where the soil was at all firm a pile was driven at every other pole. Trouble due to poles blowing over is not anticipated again on this line, and perfect service can be assured the farmers during winters to come.



To the Employees of "Pacific Service"

THE first year of our Accident Prevention work is closed. Your efforts to avoid accidents have met with much success.

Great progress has been made, yet much remains to be done ere we overcome the habit of taking chances. We must redouble our efforts to bring about an awakening to the seriousness of thoughtless action.

During the coming year an accident should be a rarity. When we leave home in the morning we should resolve that we will be careful to the end that we safely return at the end of the day—each day in the year.

Let us profit by the experiences of the last twelve months which has shown us that personal thoughtlessness is the main factor as a cause of accidents, and firmly resolve as a New Year's pledge that we will be careful, thoughtful and foresighted, to the end, that we will protect ourselves and our fellows from injury.

With this resolution and united effort, we cannot but win. Practice and preach Safety First.

We wish you and yours a prosperous and Happy New Year.

CENTRAL SAFETY COMMITTEE.

In Memoriam

WILLIAM ROBERT ECKART



W. R. Eckart, one of the best known engineers in the United States, for many years connected with "Pacific Service" as consulting engineer, died at the home of his son, Professor W. R. Eckart, at Palo Alto, California, December 8th last.

During a useful, active life of seventy-three years, Mr. Eckart solved many great engineering problems. He was connected with the mining industry in early days and in his professional capacity was the associate of the Bonanza Kings, who made history on the Comstock. He was also a pioneer in hydro-electric development work, for he was employed as consulting engineer in the construction of the Standard Electric Company's plant at Electra, now a part of the system owned and operated by "Pacific Service."

The following sketch of his life and activities is from the pen of Mr. George W. Dickie, of San Francisco, the pioneer naval architect and shipbuilder. We take this occasion to acknowledge Mr. Dickie's courtesy in preparing this for publication in PACIFIC SERVICE MAGAZINE.

Editor PACIFIC SERVICE MAGAZINE.

The Story of a Long, Active and Useful Life

THE death of Mr. Eckart brings up many memories of the problems that had to be solved in the struggle to wrest from the rocks the treasures that helped so greatly in the building up of this great commonwealth of California, and an account of a few of the unheralded achievements of his long life of service cannot fail to interest those who knew and loved him as well as guide and instruct the newer generation of engineers who are struggling for success and who could not achieve it better than by following in his steps.

He was born in Chillicothe, Ohio, June 17, 1841. His relatives, on his mother's side, were pioneers in the settlement of that part of the state. About 1842 his family moved to Cleveland where his father, as a merchant, had large shipping interests in vessels on the lakes. His early education began in private schools. After the death of his mother, which occurred when he was twelve years old, his school days were divided between the public schools of Chillicothe and Cleveland. Subsequently, with the intention of following the profession of civil engineering, he took a special course in mathematics at the St. Clair Street Academy, Cleveland.

One of his relatives was an eminent civil engineer and president of the Marietta and Cincinnati Railroad, and it was this which gave him his first bent toward civil engineering. He did not, however, follow his early desire, for in the early fifties his father moved to Zanesville, Ohio, where he had a managing interest in the Putman Flouring Mills. The power for these mills was derived from six water wheels, each of which drove one set of burrs. It was while assisting the millwright to install improved water wheels in this mill that the opportunity was afforded Mr. Eckart to serve an apprenticeship in the works of Griffith, Ebert, and Wedge, which in those days had a high reputation for general mill and steamboat work. This was a welcome billet for him, as the fascination of steamboat work had taken hold of his ambition while traveling on the Ohio and Mississippi rivers.

In his apprenticeship he was fortunate in having the friendship and guidance of Mr. Wedge, the manager of the shop, who had been an apprentice and, later, a foreman in the famous Whitworth shop of Manchester, England, where the most accurate machine tools were constructed and the methods of producing them made known to the world. He used to narrate to the writer how an apprentice in the shop was not allowed to pass judgment on his own work as "good enough," for Mr. Wedge insisted that what was "good enough" was "half spoiled." An apprentice was expected at all times to do the best he could, and Mr. Wedge had the patience and found the time to show him how to improve upon his work after he thought it "good enough."

During his apprenticeship he made numerous trips from the shop on the trials of new river boat engines and his ambition to widen his knowledge created a desire to enter the service of the government as a naval engineer. He applied for permission to be examined as to his qualifications and, after the breaking out of the Civil War, he was ordered to appear for examination in June, 1861, and on July 2d he was duly examined by a board of engineers, of which Wm. H. Schock, Chief Engineer, U. S. N., was president. His mathematical training, in addition to his shop work in connection with the river steamers, helped him during the examination and he passed number one of his date. At this examination he met Dr. R. H. Thurston, who took an interest in the young engineer and remained his close friend for life. He was appointed third assistant engineer July 30, 1861, when just twenty years of age, and was ordered at once to join the fleet of naval vessels on the Pacific Coast; and that was how he came to San Francisco.

Here he met and formed lasting friendships with many of the able engineers who were at that time beginning to do the preliminary engineering for California; these included such men as Paul Torqua, Joseph Moore, Irving M. Scott, Wallace Hanscom, Hultner, Specht, and others.

On July 10, 1864, Mr. Eckart resigned from the navy on account of ill-health and took up his residence in San Francisco, where he began work in the drawing room of H. J. Booth and Company under Irving M. Scott, who was chief draftsman. All the foundries in those early days were principally occupied in the manufacture of mining machinery and steam-boat work. On August 30, 1865, the first California-built locomotive was completed and sent out on its trial trip from the Mission to San Jose. The governor of the state and a large number of officials attended the notable event by invitation of H. J. Booth and Company. The designs and drawings for this locomotive were made by Mr. Eckart.

In the early part of 1867 he went East on a visit and while there he was examined for and licensed as a first-class chief engineer in the merchant service. Returning to H. J. Booth and Company the same year he remained with them designing mills and mining machinery until February, 1869, when he received the appointment of draftsman to the steam engineering department at Mare Island Navy Yard. He was afterwards made foreman machinist and, later, was promoted to superintendent of steam machinery through B. F. Isherwood's recommendation.

It was during this time in connection with the engineering department at the Navy Yard that he designed the machinery, propellers and dynamometers for experimenting on steam launch No. 4, upon which boat an extensive series of experiments on the relative efficiency of different propellers were made by B. F. Isherwood and Mr. Eckart. The results of these were published by Mr. Isherwood in a report to the Secretary of the Navy and in a paper by Mr. Eckart in the Transactions of the Institution of Naval Architects, London, in 1872.

In 1871 Mr. Eckart left the Navy Yard to enter into partnership with Prescott, Scheidel and Company at the Marysville Foundry. It was at this

time that the writer met Mr. Eckart and formed a friendship which lasted to the day of his death. Prescott of the Marysville Foundry was also a partner in the firm of H. J. Booth and Company. The firm name was afterwards changed to Booth and Eckart. This foundry was conveniently located relative to the mining districts and built an extensive variety of hydraulic, milling, and mining machinery. It was while there that Mr. Eckart put to good use the knowledge gained from the experiments on "Steam Launch No. 4" and contracted for, designed and built with a guaranteed speed of twenty-one miles per hour the steamer Meteor for the Carson Lumber Company to be used on Lake Tahoe. She was, I believe, the fastest boat of her size known at that date.

In 1876, the firm of Prescott, Scott, and Company, which succeeded the firm of H. J. Booth and Company, took some large contracts for pumping machinery for the Comstock, and Mr. Eckart was recalled by them to San Francisco to superintend its construction and assist in designing and erecting it. By this time quite a rivalry had sprung up between Prescott, Scott, and Company (The Union Iron Works) and the Risdon Iron Works in producing designs of machinery to handle the water and ores at Virginia City. The writer was at that time engineer for the Risdon Iron Works and his ideas were often at variance with those of Mr. Eckart, but through it all we remained good friends.

At this date the Sutro tunnel was "in" 15,500 feet and had 5,000 feet more to go and would strike the Comstock Lode just below the 1,600-foot level. The mine owners were already realizing that nothing but the heaviest and best designed machinery would meet the requirements on all the workings below the tunnel and, therefore, designs for pumps and hoists of large capacity to reach 4,000 feet below the surface were decided upon and called for. Not only the great depth but also the ventilation and sinking of shafts in virgin ground abounding in large but unknown quantities of hot water to be met and overcome, presented problems unparalleled in engineering experience in any part of the world and Mr. Eckart had a large share in dealing with and overcoming these conditions.

Having acted as consulting engineer for Sutro in sinking four shafts he had started in the line of his tunnel, the investigations then made helped him materially when the orders came for the large pumps and hoists in 1876. He spent months in Virginia City experimenting, taking "cards" from pumps where the water would boil an egg and the vapors air-bound the pumps and the expansion and contraction strains due to great changes in temperature often wrecked the heaviest castings. The knowledge thus gained was of great advantage to the firm he represented.

About this time he moved to Virginia City to reside and became consulting engineer to the "Bonanza Firm" consisting of J. W. Mackay, J. C. Flood, J. J. O'Brien and James G. Fair, who owned or controlled nearly all the "North End" mines. During this time he was manager of the Fulton Foundry, Virginia City. He was also appointed, in 1878, United States deputy mineral surveyor for the State of Nevada. During the two following years, a large part of his time was occupied in the underground

workings of the Virginia City and Gold Hill mines, investigating, planning, repairing and improving the pumps and machinery as the mines grew deeper and the water keep increasing. While still a resident of Virginia City he, in connection with W. I. Salkeld, a noted millwright of the time, designed and built the Bulwer Standard Mill at Bodie, which was one of the largest pan mills for working ore built at that time.

During the early part of 1880, Mr. Eckart was appointed a member of the United States Geological Survey under Clarence King and was given charge of investigating and reporting upon "The Mechanical Appliances of the Comstock Lode." On this work, which was practically a labor of love, he spent nearly two years, collecting data, testing pumps, engines and hoists, and making drawings for the government of all the machinery on the Comstock. The finest instruments procurable in the United States and Europe were used in the various investigations of efficiency. Hydraulic indicators tested and calibrated for from 500 to 5,500 pounds per square inch were used in testing the hydraulic pumps designed by the writer for the Cholar, Norcross and Savage shaft. Chronographs to measure and record the velocities of engines and pump rods accurate to the one five-hundredth part of a second were used on the surface and at a depth of 2,500 feet below it. The use of this instrument enabled results to be obtained which became of great value; diagrams taken from the heavy rods and pumps on the lower levels gave the clew to the location of the strains that had been so destructive in the breaking of so many rods and balance bobs in the past. The velocity curves of the rods and pumps revealed the fact not heretofore known, and only in recent years properly understood, that the elasticity of long rods could give rise to free vibrations which at times were superposed upon the force vibrations and accelerations due to the engines and pumps so that maximum vibrations and strains resulted at certain parts of the rods that exceeded the elastic limit of the timber of which the rods were constructed. Changes were thus determined in the location of balance bobs and weights which increased the efficiency of the pumps and checked the destruction of the rods and bobs. Some of these velocity diagrams, as well as illustrations of the largest pump engines and the hydraulic pumps, were published by Professor A. Riedler of Berlin while acting as Commissioner of Mines to the German government in 1893.

In 1881, Mr. Eckart removed to San Francisco and opened offices there as a consulting and constructing engineer and during the following eight or ten years some of the largest and most important mining plants were designed and constructed under his supervision. The pumping engine for the Ontario mine, with perhaps the largest Cornish pumps for deep mining ever built in the United States, were constructed from his designs during this period. The pumps were of twenty inches diameter, with ten feet stroke; two pumps at each station operated from one pump rod 2,000 feet long. In 1881 he began for Haggin and Tevis plans for all of the Anaconda Copper Works hoists and reduction works and during the following seven years all their mining work and mills were designed by him. The Anaconda Reduction Works in Montana, which were started as a silver mill

with a capacity of less than 350 tons per day, were increased in size and changed by additions until in 1888 it was capable of working 3,000 tons per day. He designed and carried out much other work for the same firm.

In 1883 the Union Iron Works was changed to an incorporated company and the writer was taken in as manager and director. Mr. Eckart was retained as consulting engineer in matters pertaining to the propelling power of the government vessels built by that company, and he was present at and assisted in conducting nearly all of the preliminary and government trials of these vessels.

In 1899 he was appointed consulting engineer to the Standard Electric Company and afterward became the resident constructing engineer for all of their hydraulic works, including storage reservoir, ditches, dams, flumes, pipe lines, and power-house installations. This was the first, or among the first, of the long distance, high potential transmission hydraulic plants projected. The water was to be brought from the Blue Lakes, situated some 9,000 feet above the sea. The power-water for the wheels was under 1,400 feet head and was to develop 15,000 horse-power. This undertaking was carried to a successful issue in 1903. The writer has often thought of this friend controlling and using the ice-cold waters of the snow-capped Sierras thousands of feet above sea level to utilize its potential head at lower levels to give light and heat and power to the peoples down by the sea, as a contrast to the work they were engaged in together some twenty-five years before, handling and forcing to the surface from thousands of feet below ground the hot water of the Comstock mines; in both cases it was pioneer work, but with reversed conditions. Such varied conditions are seldom met in any one man's engineering experience.

In regard to the man himself the writer cannot say more than Mr. Eckart once said during a conversation we had on the things that had helped us in our work, "Whatever success I have achieved in a strenuous engineering life covering fifty years' practice on the Pacific Coast has been in a great measure due to a studious life, surrounded by an extensive engineering library of American and foreign books and the appreciative assistance of associated engineers, together with the encouragement and loyalty of employers."

Mr. Eckart was honored by membership in the following engineering societies: American Society of Civil Engineers, January 5, 1881; American Society of Mechanical Engineers, April, 1882, of which he was vice-president from 1883 to 1885; The Institute of Mechanical Engineers, London, January, 1878; Society of Naval Architects and Marine Engineers, May, 1893; American Society of Naval Engineers; associate member, The Institute of Naval Architects, London.

He is survived by his widow, Mrs. Harriet L. Eckart, who had always been a splendid help to him in his work (the writer used to admire specifications written by her in the "seventies"), his daughter, and three sons who, in continuing the work of their distinguished father's life, are making for themselves names in the engineering world.

G. W. DICKIE.

Items From Women of the Company

This section of PACIFIC SERVICE MAGAZINE is open to any of our women employees who may desire to contribute notes on persons and events. The following have accepted appointment as contributing editors: Miss Letitia A. Curtis, Engineering Department, Hydro-Electric Section; Miss Margaret Dolan, Auditor's Office; Miss Bertha J. Dale, Auditing Department, San Francisco District.—Editor PACIFIC SERVICE MAGAZINE.

Mrs. Clara B. Wise, mother of the late James H. Wise, returned a few months ago from an extended trip throughout Europe and our eastern states. A great deal of her time was spent in Syria and Egypt, where she had an opportunity to study manners and customs peculiar to the various races inhabiting those ancient countries. She has compiled some interesting notes upon her experiences, from which we cull the following:

"The customs of the people of Syria and Egypt are peculiar. The descendants of the prophet Mohammed wear green turbans; the female head-covering is black, and the Mohammedan woman never appears on the street without a veil to hide her features. The Christians wear the simple red fez and the Jews are known by their peculiar side-lock, which is a single curl hanging down by the ear. They wear broad-brimmed felt hats or turbans of black cloth.

"Girls are married as early as their tenth year, and, generally, in their twelfth or thirteenth. The 'husband to be' selects a relative to arrange the marriage, because he is not permitted to see the intended bride until the wedding day. After all preparations are settled in detail the understanding is that the affianced bridegroom must pay two-thirds of the purchase money. The amount always causes a war of words which are more emphatic than elegant. He invariably objects to paying such a large sum of money for a 'pig in the bag,' for the simple reason that he has not been apprised of the color or size of the 'pig.' Eventually the price is paid and one-third is finally settled upon the wife herself, to be presented to her on the death of her husband, or, should he choose to

divorce her against her will, which is sometimes done the following day after marriage; then she remains a widow ever after. The bride wears a long cashmere shawl which envelopes her completely, and a small crown made of pasteboard adorns her head.

"The funeral ceremonies are also unique. If the death occurs in the morning the funeral takes place the same day, but if in the evening the funeral takes place the next day. The body is first washed, cotton stuffed in the ears and nostrils, and then wrapped in a green or white winding sheet and put upon a bier which is borne by friends. The female relatives and professional mourning women follow the bier with disheveled hair, sobbing aloud.

"The inhabitants of Syria and Egypt who beg for backsheesh (money) appear indeed as objects of pity. The ragged, half-naked, dirty, sickly children haunt one for a long time afterward, so that the tourist is glad to be back to his native land and wonders why in that old country there still remain such idleness, filth, such appalling neglect of cultivation of the land, with, apparently, no desire on the part of the people to ever get out of their stagnant state."

Word comes from the Colfax office that there is an assistant to Cupid hovering about that vicinity. Mr. James Martin, manager of the Drum Division, is accused of playing a dual role in conjunction with his many duties in his district. The following announcements are proof that Cupid or his deputy are somewhere around:

From St. Helena, Napa County, came the announcement of the betrothal of

Emmett Britton, of the Drum Division Engineering Department, and son of Mr. John A. Britton, our Vice-President and General Manager, and Miss Lydia Rebecca Boalt.

Also from Oakland came word of the betrothal of Jerome E. Barieau, district engineer of Drum Division, and Miss Regina Beatta Clark.

Both of the popular young couples expect to be married in the early summer and anticipate making their homes in Colfax. All concerned have many friends in Colfax who are looking forward to the weddings with much interest.

There is also a vague rumor that Harry Peterson of the Auditing Department of Drum Division will be the next to draw up plans for a home, but it still remains a rumor awaiting Mr. Cupid's consent probably.

The marriage of Mr. Henry W. Beekman of the Collection Department, Oakland District, and Miss Gertrude L. Brown of the Billing Department, took place Wednesday evening, November 25th, Rev. Dr. Dille of the First Methodist Episcopal Church of Berkeley officiating.

On Wednesday evening, November 25th, at the home of Mr. and Mrs. W. D. Davidson on Fifty-fifth street, Oakland, Mr. W. R. Brooks of the Accounting Department and Miss Luella Hitchcock were joined together in the holy bonds of wedlock. The young couple are now domiciled at the Casa Della apartments, where they are receiving the congratulations of their many friends.

The wedding of Frederick W. Brown of the Drafting Department and Miss Ruth Blewett took place on November 18th at the home of the bride on Filbert street, San Francisco. After a honeymoon spent in the southern part of the state the young

couple returned to their home in San Francisco where they are receiving the congratulations of their many friends. Mrs. Brown was formerly filing clerk in the Drafting Department.

Mr. James Parker and Miss Violet Elizabeth Johnson, both of the Collection Department, San Francisco District, were married on December 25, 1914. A week previous, on December 18th, the young ladies of the Collection Department took occasion to tender their congratulations to Miss Johnson upon her engagement by giving her a handkerchief shower. Those present were the Misses Nana Fitzpatrick, Margaret Murphy, May Dooley, Goldah Charmak, Elizabeth Anderson, Catherine McCarry, Sarah Ober and Mae Shannon.

"Pacific Service" extends best wishes to the young couple.

As a greeting for the new year just begun, we take pleasure in calling attention to the following which appeared on the editorial page of the December issue of PACIFIC SERVICE MAGAZINE:

"The women of the company have played no unimportant part in the publication of the magazine since they have been given an opportunity to voice their ideas. The many interesting features that have appeared under their signatures have been the means of bringing the women of the company into closer contact with one another, thereby creating a feeling of comradeship that would not otherwise exist.

"We hope during the coming year to receive the hearty co-operation and support of the women of all departments and districts to help make this section of the magazine one of the most important and interesting features, and the editors of this department take this means of expressing to the women of the company their thanks for the interest already manifested."



DOINGS

of "PACIFIC
SERVICE" SECTION

N.E.L.A.

CHRONICLED BY ERNEST B. PRICE

The Annual Jinks of our "Pacific Service" Section of the National Electric Light Association was held on Friday evening, December 11th, in the Jinks Room, Native Sons' building, San Francisco.

The program opened with an overture by the "Pacific Service" orchestra under the able leadership of Mr. A. C. Donaldson, director of music, and then, with the promptness of the professional stage, as the last strains of the orchestra died away the curtain parted and disclosed the "Pacific Service" minstrels, and the thundering applause which greeted them must have been very gratifying to those who had worked hard for the success of the jinks. The end men were A. L. Trowbridge, B. F. Davis, Jr., G. A. Barker and W. J. Jones, with J. W. Varney as inter-locutor. A ruse was introduced and cleverly executed; Mr. J. W. Varney stepped to the front of the stage and announced that two of the end men had failed to show up, due, undoubtedly, to some misunderstanding, but with the kind forbearance of the audience they would proceed without the dilatory members. At this juncture, however, the two delinquent colored gentlemen, Messrs. Trowbridge and Davis, came up the center isle together engaged in an animated altercation and climbed over the footlights amid the enthusiastic applause of the audience. During the progress of this number many pithy rhymes and allusions were made to various members of the company, and the clever minstrel work was generously interspersed with solos, duets, quartets and chorus work.

Mr. Richard Hunt sang his original composition entitled "Fair Exposition Land," which has been dedicated to the Women's Board of the Panama-Pacific Exposition

and accepted by the Exposition. The singing of Messrs. C. H. Oliver, J. L. Gilbert, S. G. Miles and Richard Hunt was thoroughly enjoyed, and the splendid chorus work of the Oakland and San Francisco boys reflects great credit on the individual members for their excellent support. At the conclusion of the minstrel show the "Pacific Service" orchestra played another overture, and this was followed with several selections on the accordeon by Mr. J. B. Ravano of the Oakland office. This made a great bit, as did the banjo duet of Messrs. Baldwin and Griffin.

While the stage was being prepared for the next number, the "Pacific Service" orchestra played several selections, which called forth many commendatory remarks. The fact that many inquiries were made about the orchestra justifies the publication of the fact that this is a home product, and the professional atmosphere created was due to the efficient work of the director of music and each individual member.

Next on the program came a skit entitled "A Chinatown Kilo Watt," the part of Gas Lung, the boss Chinaman, being taken by Mr. W. H. McLaughlin, and that of Sing Volt by Mr. B. D. Green, while the Pacific Service Salesman was impersonated by Mr. Wardlaw. The act of the excited boss Chinaman in short-circuiting the lighting system by cutting the cord attached to the electric iron was perfectly timed by Mr. C. B. Ohenmuller behind the scenes, and with a bang the stage and Jinks Room were plunged in darkness. "Pacific Service" came to the rescue at this point in the persons of Mike O. Farad and Shorty Circuit, Wild Trouble Hunters, who straightened out

the tangle, the parts being taken by Mr. Chas. Rhoades and Mr. Geo. Pierson, respectively. The gentle treatment accorded the rebellious meter by the two trouble men must have appealed to the electric men present.

The next number on the program consisted of a series of views of the company's plants alternating with songs containing a chorus. Then the famous trio of Oakland, composed of Messrs. Rewig, Sells and Ziegler, spotlessly attired in white as accredited chiefs of the cuisine, rendered their selection "Passing of the Dogs" in a creditable manner and created much good feeling by clever repartee while serving coffee, hot rolls and "dogs."

The program closed with an excellent interpretation of "The Picture on the Floor" by Mr. W. A. Burwell. The audience was dismissed at 11.30 p. m.

In closing, on behalf of the members of "Pacific Service" Section we wish to extend our sincere appreciation to all who in any way contributed towards the success of the evening. Mr. Earl Fisher, who looked up the talent and worked hard and enthusiastically, was called sud-

denly East and Mr. Geo. B. Furniss, chairman of the Entertainment Committee, stepped into the breach and did splendid work behind the scenes as manager and stage director. We are also indebted to our worthy secretary, Mr. Harry Bostwick, for his support and for furnishing the necessary sinews of war; to Mr. R. W. Robinson for attention to the many details which contributed to the success of the evening; to Mr. R. J. Cantrell and his department for their valuable assistance in preparing the stage; to Mr. W. Driscoll for the composition of the rhymes; to Mr. Paul Bucher for assembling the properties. The Section also provided corn-cob pipes, tobacco and matches for each member, these being distributed by the members of the Reception Committee.

It is to be hoped that the splendid start thus made will be followed up by good work and hearty co-operation in the future, so that visitors to the N. E. L. A convention next June will have an opportunity of hearing some of the excellent talent which exists in our company and so will carry away many pleasant and lasting memories of "Pacific Service."



In Memoriam

JOHN W. TERNEY

Mr. John W. Terney passed from our midst by death November 28, 1914, at his residence, 719 Thirty-second street, Oakland, after an illness of nine weeks caused by Bright's disease. He was born in Oakland in 1872. In 1887 he began as apprentice in the gas meter repair department of the Oakland Gas, Light and Heat Company, and served his time. In 1893 he was promoted to foreman, which position he held until his death. He was married in 1893 to Miss Sarah Deasy, who, with an only son, survives him. Besides, a multitude of friends mourn his loss. Jack, as he was known by all his friends and co-workers, had a pleasing and convincing manner which won him many friends. The Pacific Gas and Electric Company has lost a faithful and loyal employee. His comrades will miss his genial smile; the state a loyal citizen and his family a loving and devoted husband and father.

Pacific Service Magazine

PUBLISHED IN THE INTERESTS OF ALL EMPLOYEES OF
THE PACIFIC GAS AND ELECTRIC COMPANY

JOHN A. BRITTON - - - - EDITOR-IN-CHIEF
FREDERICK S. MYRTLE - - - - MANAGING EDITOR
A. F. HOCKENBEAUMER - - - - BUSINESS MANAGER

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EDITORIAL

1915!

At last!

The hour of opportunity for California is at hand. The day to which the entire Western world has looked forward for, lo, these many years has dawned, and already the sun is high in the heavens sending its rays of genial promise into our expectant hearts.

The stage has been set, the properties are at hand, the actors in the drama of 1915 are well versed in their parts. Now let the play go on, only let it be unlike any play that mortal man has yet witnessed in that it proceed, act after act, *ad infinitum*.

We are all eager to accept the good fortune that we know this year of 1915 will bring to us. The great waterway that joins ocean to ocean is now no longer a thing of dreams but an accomplished fact, and already the ships pass through daily on their commerce-bearing errand from seaboard to seaboard. The Universal Exposition that is to celebrate the completion of this world's greatest engineering achievement is ready, and another month will see its doors swing open to the world. California's invitation has been accepted and her guests are beginning to pour westward. And we men and women of California feel our hearts beat with a conscious pride

as we stand prepared to play our part of hosts.

It is no small responsibility that rests upon our shoulders. We have offered to show the entire world that in this cozy nook of ours on the western slope of the Sierra Nevada we have room as well as welcome for all who seek its inviting shelter, with such natural advantages as may not be surpassed in any other section of the globe; that we are people of progress, as well as a pleasure-loving people, and are in the front rank of development. We are now called upon to make good our offer. Are we ready? We think we are. But a very little time will show.

The National Civic Federation is responsible for the draft of a model bill for the regulation of public utilities.

This measure is the outcome of a report made by a Commission appointed by the Federation in 1907 to inquire into the comparative merits of public and private ownership and operation in this country and in England. The Commission was composed equally of advocates and opponents of municipal ownership and operation, together with disinterested students of economic and other public questions. It started out by agreeing that in this country, under existing conditions, private operation would be preferable to public operation provided there were adequate regulation for the protection of the public; the Commission also declared its opinion that public utilities from their nature tend to become and ought to be monopolies, but not, of course, unregulated monopolies.

Then came the organization by the National Civic Federation of a department on regulation of public utilities, whose purpose it should be to study the question of what constituted adequate regulation fair alike to the investor, the operator and the public. An executive council of nine undertook to prepare a tentative draft of a model bill. It took nearly two years to prepare it, and while all the

members of the executive council signed the draft three of them dissented from the majority as to four of the eleven main sections. The executive council consisted of the following gentlemen:

Emerson McMillin, American Light and Traction Co., New York, chairman; Franklin Q. Brown, Redmond & Co., New York, vice-chairman; John H. Gray, head of Department of Economics and Political Science in the University of Minnesota, secretary; Edward M. Bassett, attorney and former member of New York Public Service Commission, First District; Halford Erickson, member Railroad Commission of Wisconsin; William D. Kerr, attorney, Chicago; Blewett Lee, general solicitor of Illinois Central Railroad Co., Chicago; Milo R. Maltbie, member New York Public Service Commission, First District; Arthur Williams, chairman Association of Edison Electric Companies and President of American Museum of Safety.

Space does not permit of discussing this measure fully, as it is of elaborate proportions. The fact, however, that extraordinary pains were taken by the National Civic Federation to select for its purpose a body of men representative in character and experience to deal with this all-important question of regulation and that the result of their two years' labors still leaves some of the many important points under consideration yet undecided so far as any opinion upon their determination being unanimous, reveals something of the scope of the inquiry. It seems, also, to prove conclusively that no man, nor body of men, can either dismiss in off-hand fashion so important a subject as the regulation of public utilities or arrive at the solution of the problem by any short cuts or time-saving routes.

LEAGUE'S NEW LEASE OF LIFE.

The Electrical Development and Jovian League ushered in the year 1915 with a get-together luncheon in San Francisco on January 6th. It was in the nature of

a rejuvenation meeting, with our Mr. Geo. C. Holberton, manager of the San Francisco District, in the rôle of chief rejuvenator having charge of the program of entertainment.

A feature of the proceedings was an address by Mr. George Drake Smith of New York, special representative of the Electric Vehicle Association of America, who, of course, spoke upon the subject nearest to his heart and told of the progress in public favor of the electric truck for quick and efficient service. "Pacific Service" provided Messrs. J. L. Gilbert and Richard Hunt to furnish vocal music in between courses.

There was a muster roll of one hundred and twelve, the best seen in many a day. It plainly showed that the league had received a new lease of life, and now it bids fair to grow steadily and surely.

ACTIVITIES OF "PACIFIC SERVICE" TENNIS CLUB.

In the round robin tournament of the "Pacific Service" Tennis Club, the standing of the teams is as follows:

1. Henley and Delaney.
2. Frickstad and Carpenter.
3. Dangers and Dougherty.
4. Dazey and Miles.
5. Uibigau and Van Zandt.
6. Trowbridge and McDougal.
7. Onemuller and Bucher.
8. Fisher and Vincent.
9. Monroe and Steele.
10. Rogers and Szczpanski.
11. Vensano and Dodge.

The committee has received the following challenges which will be played as soon as the weather permits:

Dangers and Dougherty vs. Henley and Delaney; Frickstad and Carpenter to play the winners of this match.

Dazey and Miles vs. Uibigau and Van Zandt. A. L. Trowbridge and J. H. McDougal to play the winners.

Onemuller and Bucher vs. Monroe and Steele.

Rogers and Szczpanski vs. Vensano and Dodge.

Tidings From Territorial Districts

San Francisco District

Progress of Electrical Construction Work in San Francisco

Excellent progress is being made with the additions to our substation facilities in San Francisco. The Exposition and the extensions to the Municipal Railway system, together with the growth of the company's general lighting and power loads, have made necessary important additions to some of the existing substations and the construction of several new substations.

An extension to Station I, at Eighth and Minna streets, has been completed. One 1,000 K. W. rotary converter has been installed for supplying 600-volt power to the Municipal Railway, also a concrete structure for the 11,000-volt bus-bars and switches, with seven double compartments, of which five have been equipped. The work has been done in accordance with plans which provide for still further increases in the equipment at this point.

Station F, the permanent substation for supplying the Exposition with electric power, has been practically completed. Power from this substation was first delivered to the Exposition early in December. Certain of the lines of the Municipal Railway are also supplied from Station F.

A concrete structure for the 11,000-volt bus-bars and switches has been constructed with sixteen double compartments. To supply the Exposition six 1,500 K. W. transformers, arranged in two banks and transforming from 11,000 volts to 4,150 volts, have been installed, also seventeen rectifier sets for supplying circuits for magnetite arcs. In addition, the Exposition will receive about 2,500 K. W. at 11,000 volts.

Three 1,000 K. W. motor generator sets have been installed for supplying 600-volt power to the Municipal Railway. A switchboard of forty-three panels provides for the control of the apparatus.

The peak load capacity of this substation, which without doubt will be fully utilized, will entitle it to rank as one of the largest substations in San Francisco.

An addition to Station J, on Sacramento street near Montgomery, is well along toward completion. The extension is, in fact, much larger than the original station. A special effort has been made to obtain a pleasing appearance, both external and internal, and to obtain an installation which will represent the best

modern practice. At the present time a concrete structure with ten double compartments for the 11,000-volt bus-bars and switches is being constructed. Two 1,000 K. W. motor-generator sets for supplying 600-volt power to the Municipal Railway and one 250 K. W. balancer set for the 250-volt direct-current service are being installed, together with two large switchboards which will control the equipment.

Good progress is being made with the building for Station K, located at Twenty-fourth avenue and Balboa street, in the Richmond district. This is an entirely new station, designed to supply the growing demands for power in the districts north and south of the Park. The substation will be housed in a handsome building. The general arrangement has been specially planned to permit of easy extension as the load in this district increases.

A very important addition to the switch-house at Station A is being made. A concrete structure containing nineteen double compartments is being added to the existing switch-house. Cable terminal compartments are being constructed with the new switch-house and added to the original installation. The first half of the new work was put into service as the old year was closing. As a measure of the growth of the load carried by Station A, it may be said that the original installation of outgoing cables was four. When the work now in progress is completed there will be twenty-three outgoing cables, most of which will be more than double the capacity of any of the original four.

J. P. JOLLYMAN.

Vernon Ellsworth, a mail boy employed in our San Francisco office, was recently operated upon for appendicitis and will not be able to leave the hospital until about February 1st. To help meet the expenses of his sickness a subscription list was opened by Mr. R. J. Cantrell, and members of "Pacific Service" responded to the tune of \$124.95. A check for this amount was given to Vernon's sister, his only near relative, and the young lady wishes to express her gratitude to all those who helped to lighten her burden.

Drum District

If you had stood just outside the Drum power-house with me on Christmas eve and let your gaze wander up and up and

over the hill toward Forebay, and if someone had jingled a string of sleigh bells you would have been prepared to take your solemn oath that the Old Saint himself was just about to drop into our peaceful canyon from beyond the mountain crest. For snow was there, about a foot and a half of it, numberless real Christmas trees growing on all sides glistening with wondrous frost lights, the atmosphere as clear as only high Sierra atmosphere can be, the snow sparkling with myriad diamonds too lovely to describe, and overhead the clear bright heavens studded with many a brilliant star that but added to the glory of a perfect Christmas moon. Yes, if Santa Claus had dropped in at that moment he would have found a more perfect replica of his traditional setting than a great many localities of this golden state could furnish.

But he did not come, at least, not while I watched. However, he did find us during the night when "not a creature was stirring, not even a mouse," nor yet the big tom-cat that nightly yowls beneath the boarding-house, and with the able assistance of Mrs. Henley produced an enormous and at the same time beautifully decorated Christmas tree loaded with gifts for everyone who had not been able to answer the irresistible call of home.

Santa's agent in the person of Mr. Henley picked the fruit from the tree and distributed it with impartial goodwill to all on the evening of Christmas day, and then all joined in a rousing game of "Pit" in which more lively trading took place than our financiers would have you believe is possible in these disturbed and warlike times. There was much noise and jollity as the strenuous trading went on, even until the big round moon hung low in the sky and Christmas day was over.

Besides the big tree each family of little tots—and we are blessed with three such families in Drum—had an individual tree of their own. Wee Bobby and "Ole" Ruth were awakened on Christmas eve by a sudden jingling of bells and raised sleepy heads to catch a glimpse of Santa Claus beside their lovely tree, but being very shy for one so old, he was gone before the heavy eyes were opened. Bobby, aged four, said, "I guess the things'll stay there till tomorrow mornin'—let's go sleep, Ole;" and was off at once into the sandman's country.

But it was far different on the hill where Jack and Audry Roberts live. They lay awake waiting, but a careless postman had failed to deliver their big box of toys, Christmas tree ornaments and candy. Jack couldn't understand how Santa passed them by, especially, he added, "when he's been good 'mos' a week." However, we all consulted calen-

dars and discovered we'd made a very funny mistake—it really wouldn't be Christmas until "day after tomorrow." And sure enough "day after tomorrow" found Audry and Jack dancing gleefully around a wonderful fir tree, with limbs fairly groaning under a weight of toys. And now Jack derides the rest of us because "we" didn't know when Christmas "wuz."

The third tree grew up right next to the crib of Baby John Pollard, the littlest one of all. He watched the twinkling lights contentedly hour after hour, until he finally fell asleep in his mother's arms, grasping in his chubby hands a Kewpie rattle and a wonderful painted ball.

We must not forget to mention the culinary features of the day. Mrs. Ruth, the proprietress of our excellent boarding-house, served a most delightful dinner, the piece de resistance of which was a perfect turkey, around which a menu was built that included all the usual Christmas embellishments, not forgetting much fine homemade candy.

Drum is far from the crowded highways, but Christmas did not pass us by without a large share of "Peace on earth and goodwill to all men," and, especially, our brothers and sisters of "Pacific Service."

LOYD HENLEY.

Nevada District

The grand old sentiment, "On earth peace, goodwill toward men," was manifested in the old mining camp of Grass Valley, where the spirit of good cheer prevailed as of old. Grass Valley had been prosperous the past year and everybody, old and young, caught the holiday spirit.

Christmas eve found the streets echoing with Christmas music. From time immemorial Grass Valley has had carol-singing, and this year, it seems, the music was better than ever. Following the custom of past years, on Christmas eve the carol singers met at the corner of Main and Mills streets and with lusty voices entertained thousands of Grass Valleyans with carols; and there is no people, nor place, where such singing, at this time of the year, is so soul-inspiring, the singers throwing their whole soul and spirit into these songs. Grass Valley is exceptionally fortunate in possessing more vocal talent to the square yard than any town of its size in the state. In these carol choirs, ages run from ten years up to sixty-five, and all good singers at that.

In addition to the carol-singing, the people of Grass Valley are a cheerful "bunch" and a stranger in our midst at such a time would wonder at the jollity and mirth of our people. "Merry Christmas" was the salutation everywhere.

Christmas morning divine services were held at the Episcopal and Catholic churches, with splendid Christmas music for the occasion. In the evening the Methodist choir gave its annual Christmas concert, which is always looked upon as a special treat to the music loving citizens. The carol singers appeared on the streets again Christmas morning and favored the people with more carols. This was followed by a concert from the Grass Valley Concert Band, and all the music, both vocal and instrumental, was thoroughly enjoyed by the large crowd that appeared on the streets.

Turkey was surely slaughtered on Christmas day. Turkey everywhere and every hour, and the victory over Christmas turkey was great and enjoyed usually by the victors.

The Sunday after Christmas the carol singers had charge of the services in the different churches and every house of worship was crowded.

In Nevada City the people are not so well off for carol singers as those of Grass Valley. However, we made up in other matters of enjoyment and good cheer. Everybody seems to have had a good time.

The Elks' new home was the scene of goodwill and good cheer, and everybody who visited there, whether members or not, were welcomed and enjoyed themselves. The spirit of good heartedness and jollity prevailed. The old town or city knows how to do things.

The Christmas decorated windows in the stores were very attractive and the P. G. & E. Co., in conformity with the spirit, decorated its windows. In one window we had a Christmas tree decorated with colored lamps and a display of electrical appliances. We borrowed an electric train and track, which was very attractive, with "kewpie" as engineer. In another window we had a small motor generating set with miniature pole line and street lamps in action. This was very attractive. Also in this window we showed an electric meter, gas meter and water meter. On the whole, our windows were very pretty and interesting.

New Year's eve the fire department had its annual masquerade ball and the large crowd of masquers was surely great and in many cases original. The party was a great success in every respect.

Christmas time in mining communities is surely a grand institution. May it continue so.

JOHN WERRY.

Mr. J. B. Young, one of the oldest employees of the P. G. & E. Co., has tendered his resignation, effective December 31, 1914. Mr. Young has been appointed deputy sheriff by Sheriff-elect John Martin, and will serve in that capacity for the next four years and possibly longer.

In 1895 Mr. Young was the owner of an express wagon and ran an express business, and when the Nevada County Electric Power Company started they engaged Jim and his team to do its hauling, and continued so to do for two or three years, when the company, through Mr. De Sabla, purchased the Young outfit and employed him at a monthly salary. Mr. Young has been with the company from that time until the present and has been a true and faithful worker for the company during its ups and downs through all these years. Mr. Young regrets very much severing his connection with this company, but with the idea and hope of bettering his condition, he has accepted the position as deputy sheriff.

Stockton Water District

Twenty-five years ago Stockton claimed to be a city of 10,000 inhabitants, boasted of a few blocks on Main street paved with basalt and contained a street railway extending from El Dorado street via the head of the slough to the Southern Pacific Railroad depots, operated with the motive power of mules and horses. In that year Mr. Reibenstine was the mayor of Stockton, the first under the city charter. And now after twenty-five years, Mr. Reibenstine is again mayor of the city under a commission form of government, and the population has gone along to about 40,000.

In a pleasant little address the other day the mayor said that the Christmas habit was prevalent that year, a quarter of a century ago, as it had also been every succeeding year since. But that there had never been a Christmas in Stockton where there were so many needy families within its borders as at the present time, and that while 1914 had been a year of industrial strife, still it was the one year in which the most notable progress in the history of Stockton had been made, and there was so much to be thankful for and so much prosperity that he hoped the more prosperous citizens would lend a helping hand to the needy. The Rotary club took it up first, and appointed a committee to search out twenty-five families whom they would care for, supplying them with food, coal, warm clothing and allowing the children of needy families to be kept at school.

The civic bodies of the Associated Charities made a systematic canvass of the city, with the intention that there should be no family in Stockton lacking for Christmas cheer and assistance. And they found and cared for a good many of them.

The city took on its holiday appearance early and heartily. The picketing by the unions, which had prevailed so insistently the last six months, entirely disap-

peared, and it will not be likely soon to return again, for the employers and the unions buried the hatchet on December 21st and reached an agreement whereby the conditions of "open shop" were acknowledged and accepted.

The most notable other events of the year 1914 in Stockton were the doubling of its area by the taking in of three adjacent districts and the acquisition by gift of a twenty-seven acre park, the above constituting the first expansion of the city limits since the time of Captain Weber, its founder.

During this year the distributing system of the Pacific Gas and Electric Company has been increased by the addition of some ten miles of water mains. In prospect, the year 1915 bids fair to be a most favorable one in Stockton.

J. W. HALL.

De Sabla District

The stormy days had cleared, leaving the higher elevations enrobed with a heavy coat of snow; the sun shone brightly and the creeks were springing; all Nature seemed at its best. The U. S. mail had been exceptionally heavy for several days previous and Santa Claus had been storing his gifts under the house, in the attic; in fact, most of the isolated corners were well filled.

As the time for exposure was drawing near the Christmas trees were secured from around camp and the little fellows were ushered to bed quite early so as not to interfere with Santa's travels.

About 9.00 p. m. all was in readiness at the Carl home and the children were awakened by "the departure of Santa Claus" or the stampede of the observers on the front porch (which included all operators not on duty. As if touched by magic the door flew open and the three youngsters, "with eyes like doughnuts," viewed the workings of Santa and the many presents he had left them. All joined in assisting the children to operate their toys and the "Dancing Coon" played an important part in the evening's program which terminated with the serving of a light lunch.

Because of Santa losing his "aviation cap" he was unable to make his flight to "Raishville" until about 4.00 a. m., but because of the very short days in this locality he yet had several hours before daylight. Upon leaving he fell over a "skunk trap" and awakened the little girl who had been sleeping (?) with one eye open, and she realized that there were such things as "magnified visions."

The older ones of the camp were not forgotten, and upon arising Christmas morning found the fireplace covered with

filled stockings of various shapes and sizes.

The boarding-house had been very artistically decorated and electric heaters, having arrived Christmas eve, had been installed in all the rooms. Through the efforts of the management an excellent dinner was served. The afternoon was spent by indulging in various games resulting in "a general good time for everyone." A most enjoyable evening was spent at the home of Mr. Raish.

"Isolation" did not in any way interfere with Christmas here because of the "insulation" afforded by "Pacific Service" having a very great "safety factor."

J. R. CARL.

Petaluma District

Christmas 1914 marked the first outdoor community Christmas tree in the history of Petaluma; and the honor belongs to the Kentucky-street merchants who conceived and made possible this celebration.

The tree was a wonderful thing, not for its beauty alone, but for the spirit it aroused in the town. It occupied a position in the center of the block on Kentucky street and was brightly lighted with "Pacific Service," which service was donated to the cause. During the evening josh gifts were distributed while offerings were made for the city's poor. Christmas carols were sung at the tree's base and an orchestra alternated with the singers.

The street was closed to traffic and, later, swept clean, and dancing was indulged in by many young people. All of the extra street lights were burning until a late hour and the bells were kept pealing. There was not a dull moment, not a disappointed person and not one who was not surprised and delighted.

L. HORWEGE.

Santa Rosa District

Both Christmas day and Saturday following were quite generally observed in Santa Rosa. However, we did not close our offices on Saturday, the office force dividing up among themselves the duties of keeping open so as to reply to trouble work.

The members of "Pacific Service" generally celebrated Christmas quietly in family gatherings. However, I think the company can honestly claim to have had the handsomest decorated window in Santa Rosa for the holidays, one which attracted very general attention. It was intended, and I think did, teach many a lesson. The window had, as a background, and to give the Christmas effect,

a handsomely decorated Christmas tree, the floor being snow-clad. The tree was lighted both by electric lights and old-fashioned Christmas candles. In front and to one side were candles in old-fashioned brass and silver candlesticks, coal oil lamp and open gas-jet burning. To the other side of the window, as an offset, were burning carbon, mazda and reflex gas lamps. An open wood fire supported an old-fashioned tin coffee pot and sad iron; offsetting this was an electric coffee percolator and electric sad iron. The whole was placarded "The old way" and "The new way."

Besides numerous Christmas bundles we showed as Christmas presents electric and gas heaters, grills, etc., and, as a whole, I think, made a very effective lesson in the progress of lighting, heating, etc.

Colgate District

Christmas was a very beautiful and very quiet day at Colgate. A few of the boys spent Christmas at their homes nearby, and those left in camp just filled up on turkey and smoked cheroots the remainder of the day. In the evening a number of them went to a dance near Dobbins, and managed to get back in time for breakfast the morning after.

There had been too much butterfly life just prior to Christmas to make much of a stir. All available loose change had been used in buying a new Edison disc machine for the club-room, and giving a dance and card party.

On December 12th the boys gave a dance, and had about thirty couples, which is a big crowd, for the size of our ball room. At midnight good substantial refreshments were served, after which the dancing continued till 5.30 a. m., and the cleaning up till nearly 5.30 p. m. But everybody had a fine time.

On December 18th a farewell party was given Mr. J. F. Wheelock, first operator, who recently left Colgate after residing here two years and a half. Whist was played during the evening, Mrs. C. H. Becker capturing the ladies' prize and Frank Alpers the one for gentlemen. Music, dancing and the ever present eats helped to make the party a pleasant one.

Given time we will be doing the fox trot, playing auction bridge and giving Bach recitals at Colgate.

MILES P. WERRY.

Chico District

The city of Chico celebrated its first annual municipal Christmas tree on Christmas eve. The attendance was estimated at 5,500, of which 1,500 were children,

many of whose hearts would be gladdened by no other Christmas cheer, gathered in eager throng around the large electrically illuminated tree in the center of the City Park. The night was ideal, it was clear and crisp, just crisp enough to remind one it was Christmas eve.

The celebration in Chico may take first rank above those of many other California cities which observed the day similarly, as Chico was the first city north of Sacramento to propose the municipal Christmas tree. It is expected that this celebration will be made an annual affair.

The Christmas spirit was also given voice in all the local churches.

H. B. HERVFORD.

Sacramento District

The corner window of the ground floor in the Sacramento District office brightly reflected the spirit of Christmas and good cheer during the festive season to all passersby. Through the kindness of Mr. Martin of Colfax District, Sacramento obtained a beautiful fir tree direct from the mountains and from among the "patriarchs" that fostered it. The tree was gaily decorated through the able efforts of the young ladies of the district office, and the branches at night were emblazoned forth with "Pacific Service."

Sacramento District has just recently completed an appliance display nook and lamp sales counter on the ground floor of its new office building. A counter height partition of marble to match the interior finish of the main floor is provided with oak counter top, and the arrangement which will greatly assist toward making sales in this department also greatly adds to the general attractiveness of the main office floor.

C. W. McKILLIP.

Electra District

Christmas at Electra was very quiet this year owing to the fire which destroyed our club house.

The usual turkey dinner was served to the employees, and the afternoon was very pleasantly spent with cards and music. All had a good, if a quiet, time.

W. E. ESKEW.

Solano District

W. A. Scott, a scientific farmer near Dixon, has installed electric lights in his hen-houses. These he turns on at five o'clock every morning and burns them until daylight, on the theory that the simple-minded hens will think it is "the

good old summertime" and be governed accordingly. As a matter of fact, the birds jump off their roosts and start in eating and scratching as soon as the lights are turned on, thereby getting much more exercise than they would otherwise, which is conceded to be necessary for the production of eggs.

Mr. Scott has 125 watts in lamp capacity installed, and states that as it costs him but two cents a day to operate them it takes but one-half an egg a day increase to offset this expense, and he has tried the arrangement long enough to feel that the increase is considerably more than this.

C. R. Fontana of Dixon, one of the most prominent and successful poultrymen in this section of the country, has also just put in an installation similar to Mr. Scott's.

Mr. H. J. Guise of Winters, formerly an instructor in the poultry department at the State Farm, is using electric brooders. He states that he has had experience with almost every brooder manufactured, from the gasoline to the fireless type, and that his present equipment is superior to anything he has ever seen. Its economy, automatic regulation, freedom from fire risk, and the fact that it does not vitiate the air in the brood-house leaves nothing to be desired. Fourteen cents worth of electricity per day will keep one thousand chicks in excellent condition. The brooders consist of a suitable housing equipped with some old style carbon lamps as a source of heat and a very good thermostat to automatically maintain temperature at the desired point.

C. E. SEDGWICK.

Marysville District

The Christmas season in Marysville was fittingly celebrated, and was one of the most enjoyable in several years. Although there has been some talk of hard times it was not in evidence here during the holidays, and the poor people of this community, who were unable to provide for themselves, were remembered by the two relief societies, and each and every one of the seventy-five children in these families received toys, nuts, candy and many other good things.

The merchants of Marysville report a most excellent business for the holidays, in fact, much better than they had anticipated. "The people shopped early this year," said one merchant, "and that is why the last day rush was not in evidence, as is generally the case." If there are hard times, the people of Marysville have not felt them yet, for this town was never more prosperous than it has been this year.

Prosperity is visible everywhere, and the wave of good times has completely

enveloped not only Marysville but Yuba and Sutter counties as well. Christmas of 1914 was one of good cheer and general rejoicing in all the word implies, and 1915 is being looked forward to as the biggest year, from all points of view, the people of this section have ever experienced. Prosperity is here to stay, and while the people of distant states are going through "hard times" the merchants and business men of this section are wearing broad smiles, which is a sure indication that they are satisfied with the existing conditions generally.

Work on the levee and ditches in District 10, Yuba County, is about completed, according to the announcement by contractors in charge. The construction of the reclamation project was made possible by a bond issue of \$100,000 which was voted by the district the first of the year.

The completion of the reclamation work marks the opening of a vast area to farming orchard and rice culture. It is said the soil there is of a superior quality and that almost every conceivable vegetable and fruit can now be grown with the aid of irrigation.

It has taken about \$80,000 to make the project possible, and the trustees of the district will have about \$20,000 left with which to make any repairs which may become necessary. The sale of the bonds has proven satisfactory, \$30,000 of them having been sold to date.

The Feather river levee has been raised several feet for its entire distance through the district. Several thousand acres of land are thereby protected and served with water through a number of drainage canals. The Western Pacific Railroad has raised its grade to conform to the work done by the district.

Because of the heavy rains for the last few days work on the big project of the Natomas Consolidated near Pleasant Grove has been held up. The contractors in charge, however, are planning to rush the work to completion as soon as the pleasant weather returns.

The work of building the levees is nearly finished, and it is hoped to have them entirely completed by the time the continuous heavy rains come. The rain transformed the wagon trails up over the levees under construction into rivers of mud and made it almost impossible for the horses to plough through.

According to a report filed with the board of supervisors, Blake Brothers of Oakland, who have the contract for the bridge over Butte slough, have the structure nearly completed. As a result they have been paid \$35,000 additional for their work, there being \$16,000 more to be paid. It is eighty per cent complete at the present time.

All things considered we have had a prosperous year in this district. Business has been good and losses small. Agricultural power was not quite so good in 1914 as it might have been, owing to the heavy rainfall of the previous year, but we hope to make this up by increased business in 1915, and which looks very promising.

Prospects look very favorable for "Pacific Service" in the Marysville District.
J. E. POINGDESTRE.

Fresno District

On Christmas eve the Playground Commission had a municipal Christmas tree at the Fresno Auditorium. More than five thousand people were in attendance, and the affair was so very successful that the practice will be kept up from year to year. The children took part in all sorts of games, songs and dances, and all receiving presents.

At noon on Christmas day the Commercial Club gave a barbecue near the Holland building to the unemployed. Nine hundred men, women and children were fed at this barbecue. The Raisin Association contributed five hundred packages of raisins and a wholesale bakery the bread, the rest being taken care of by the Commercial Club.

New Year's eve was particularly lively. The streets were crowded all evening—noisy crowds with confetti, horns and all other noisy apparatus that could be found. It was a well-governed crowd, however, and there were no disturbances at all, although the celebration did not break up until late in the morning. The cafes were crowded, and all the clubs had celebrations, waiting for the New Year to come in.

On New Year's night there was a municipal dance held at the City Auditorium. The hall was packed to overflowing, and the affair was such a distinct success that the Board of Trustees expect to hold a municipal dance once a month. On the floor the ages ranged from twelve to eighty—gray heads and bald heads mingling with the youngsters, making the affair unique and also a great success.

All of these celebrations have created generally a very good feeling, and will, no doubt, next year be organized much better than they were even this year.

We are now in the process of erecting a steel and sheet iron generator house at the gas works over generator No. 2. It has been much needed, and will greatly improve operating conditions in general at the works.

We were recently visited by Mr. Hughes of the Central Safety Committee, and at a called meeting of all the employees he

addressed them on safety first ideas in general. We enjoyed his visit much. Our local committee has showed much interest in this safety first and are always on the job looking out for hazards. We have a general meeting every month at which we have a general discussion on safety first, and afterwards one department or the other puts on some educational feature, either on the works or distribution.

Mr. Carl Bolting of the office force is the proud father of a son.

Our office is now heated with the Rector Heating system, and it is proving more than satisfactory. It has also attracted a great deal of attention from the public in general, and we will, no doubt, place a great many of them as a result of having this installation in our own office.

M. L. NEELY.

Redwood District

On Christmas day the peninsula was visited by a very heavy fog, although it did not dampen the spirits of the employees of the Redwood District. Mr. Britton spent from four to six o'clock in the afternoon visiting his daughter, Mrs. Kellogg, at "Dun Muvin," Redwood City. The Kelloggs kept open house during the day with a big Christmas tree for the kiddies. Our district manager and his family spent the day in Chico. The other employees spent the day with friends and relatives around the bay. Everyone agrees that it was the "best Christmas ever."

E. W. FLORENCE.

Yolo District

Christmas in Woodland was quietly observed. As it is a city abounding in churches, Christmas trees were the order of the day.

I am informed that the attendance at Sunday schools doubled in December, for, as Eugene Field's little poem states, "Just before Christmas I've good as I can be."

A fund of nearly \$400 was collected and Christmas cheer bought for the poor and needy.

W. E. OSBORN.

Contra Costa District

With the spirit of Christmas still in the air, the employees of the Contra Costa District returned to their various labors, happy and content after a merry celebration.

With the gift of a perfect California climate, we enjoyed as delightful and pleasant a Christmas as has ever been our lot.

DON C. RAY.

PACIFIC GAS AND ELECTRIC COMPANY

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HENRY E. BOTHIN
JOHN A. BRITTON
W. H. CROCKER
F. G. DRUM

JOHN S. DRUM
F. T. ELSEY
D. H. FOOTE
J. E. GLADSTONE
W. G. HENSHAW

A. F. HOCKENBEAMER
SAMUEL INSULL
JOHN D. MCKEE
C. O. G. MILLER
GEORGE K. WEEKS

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A. BRITTON	Vice-President and General Manager
H. HOCKENBEAMER	Second Vice-President and Treasurer
J. GLADSTONE	Third Vice-President
D. H. FOOTE	Secretary and Assistant Treasurer
C. LOVE	Assistant Treasurer
S. L. BARRETT	Assistant Secretary
K. PARKER	Assistant Secretary

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F. G. BAUM	Chief Engineer Electrical Construction
W. B. BOSLEY	Attorney
M. H. BRIDGES	Auditor
R. J. CANTRELL	Property Agent
P. COGHLAN	Manager Claims Department
P. M. DOWNING	Engineer O. & M. Hydro-Elec. Department
E. B. HENLEY	Manager Land Department
JNO. H. HUNT	Purchasing Agent
J. P. JOLLYMAN	Engineer Electrical Construction
E. C. JONES	Engineer Gas Department
W. H. KLINE	General Agent
S. J. LISBERGER	Engineer Electrical Distribution
F. S. MYRTLE	Manager Publicity Department
L. H. NEWBERT	Manager Sales Department
GEO. C. ROBB	Superintendent of Supplies
F. H. VARNEY	Engineer O. & M. Steam-Elec. Department
H. C. VENSANO	Civil and Hydraulic Engineer
W. G. VINCENT, JR.	Valuation Engineer
S. V. WALTON	Manager Commercial Department

DISTRICT MANAGERS

District	Headquarters	Manager
ALAMEDA COUNTY	Oakland	F. A. LEACH, JR.
CHICO	Chico	H. B. HERYFORD
COLGATE	Colgate	MILES WERRY
COLUSA	Colusa	L. H. HARTSOCK
MARTINEZ	Martinez	DON C. RAY
DE SABLE	De Sable	I. B. ADAMS
COLFAX	Colfax	JAMES MARTIN
ELECTRA	Electra	W. E. ESKEW
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DIXON	Dixon	C. E. SEDGWICK
NEWMAN	Newman	W. A. WIDENMANN
STOCKTON	Stockton	J. W. HALL
VALLEJO	Vallejo	A. J. STEPHENS
WOODLAND	Woodland	W. E. OSBORN

All things considered we have had a prosperous year in this district. Business has been good and losses small. Agricultural power was not quite so good in 1914 as it might have been, owing to the heavy rainfall of the previous year, but we hope to make this up by increased business in 1915, and which looks very promising.

Prospects look very favorable for "Pacific Service" in the Marysville District.

J. E. POINGDESTRE.

Fresno District

On Christmas eve the Playground Commission had a municipal Christmas tree at the Fresno Auditorium. More than five thousand people were in attendance, and the affair was so very successful that the practice will be kept up from year to year. The children took part in all sorts of games, songs and dances, and all receiving presents.

At noon on Christmas day the Commercial Club gave a barbecue near the Holland building to the unemployed. Nine hundred men, women and children were fed at this barbecue. The Raisin Association contributed five hundred packages of raisins and a wholesale bakery the bread, the rest being taken care of by the Commercial Club.

New Year's eve was particularly lively. The streets were crowded all evening—noisy crowds with confetti, horns and all other noisy apparatus that could be found. It was a well-governed crowd, however, and there were no disturbances at all, although the celebration did not break up until late in the morning. The cafes were crowded, and all the clubs had celebrations, waiting for the New Year to come in.

On New Year's night there was a municipal dance held at the City Auditorium. The hall was packed to overflowing, and the affair was such a distinct success that the Board of Trustees expect to hold a municipal dance once a month. On the floor the ages ranged from twelve to eighty—gray heads and bald heads mingling with the youngsters, making the affair unique and also a great success.

All of these celebrations have created generally a very good feeling, and will, no doubt, next year be organized much better than they were even this year.

We are now in the process of erecting a steel and sheet iron generator house at the gas works over generator No. 2. It has been much needed, and will greatly improve operating conditions in general at the works.

We were recently visited by Mr. Hughes of the Central Safety Committee, and at a called meeting of all the employees he

addressed them on safety first ideas general. We enjoyed his visit much. The local committee has showed much interest in this safety first and are always the job looking out for hazards. We had a general meeting every month at which we have a general discussion on safety first, and afterwards one department the other puts on some educational feature, either on the works or distributed

Mr. Carl Bolting of the office fore the proud father of a son.

Our office is now heated with the Hot Water Heating system, and it is proving more than satisfactory. It has also attracted a great deal of attention from the public in general, and we will, no doubt, find a great many of them as a result of installing this installation in our own office.

M. L. NEEL

Redwood District

On Christmas day the peninsula was visited by a very heavy fog, although it did not dampen the spirits of the employees of the Redwood District. Britton spent from four to six o'clock the afternoon visiting his daughter, Kellogg, at "Dun Muvin," Redwood City. The Kelloggs kept open house during the day with a big Christmas tree for the kiddies. Our district manager and family spent the day in Chico. The employees spent the day with friends and relatives around the bay. Every one agrees that it was the "best Christmas ever."

E. W. FLORENCE

Yolo District

Christmas in Woodland was quietly served. As it is a city abounding in churches, Christmas trees were the order of the day.

I am informed that the attendance at Sunday schools doubled in December, for, as Eugene Field's little poem states: "Just before Christmas I see good as I see."

A fund of nearly \$400 was collected and Christmas cheer bought for the poor and needy.

W. E. OSBORN

Contra Costa District

With the spirit of Christmas still in the air, the employees of the Contra Costa District returned to their various labors happy and content after a merry celebration.

With the gift of a perfect California climate, we enjoyed as delightful a Christmas as has ever been our lot.

DON C. RAY

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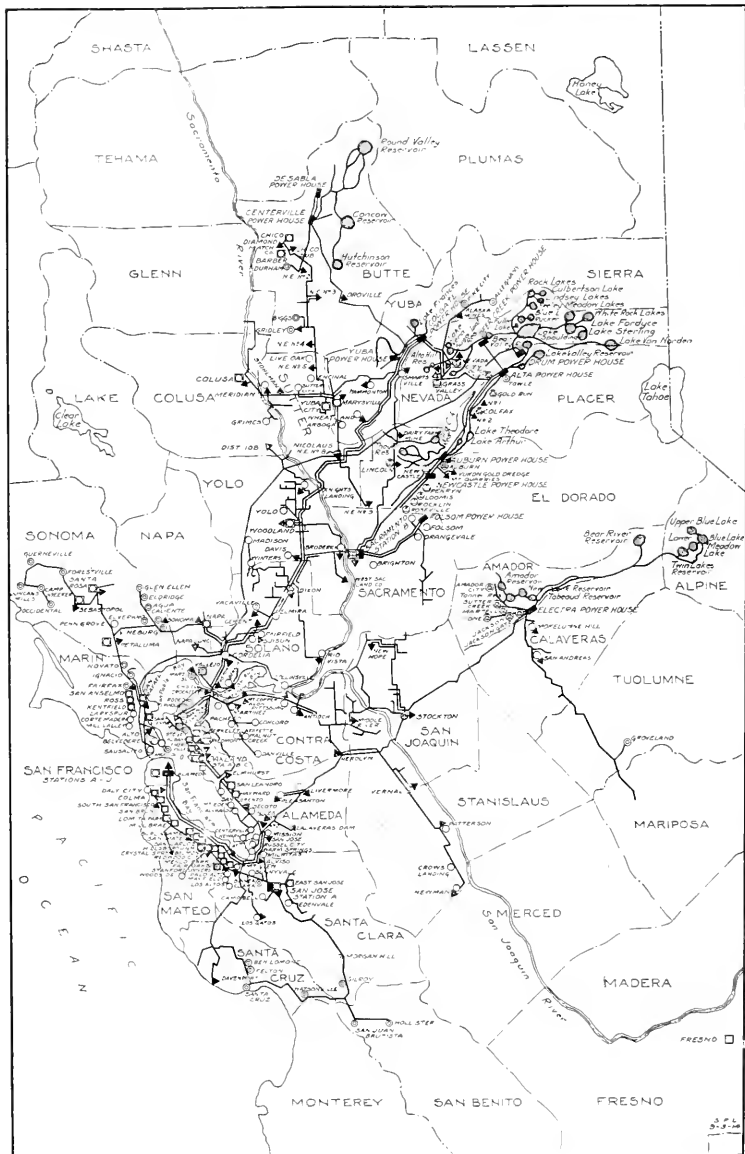
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CHICO	Chico	H. B. HERYFORD
COLGATE	Colgate	MILES WERRY
COLUSA	Colusa	L. H. HARTSOCK
CONTRA COSTA	Martinez	DON C. RAY
DE SABLE	De Sable	I. B. ADAMS
DRUM	Colfax	JAMES MARTIN
ELECTRA	Electra	W. E. ESKEW
FRESNO	Fresno	M. L. NEELY
MARYSVILLE	Marysville	J. E. POINGDESTRE
MARIN	San Rafael	W. H. FOSTER
NAPA	Napa	C. D. CLARK
NEVADA	Nevada City	JOHN WERRY
PETALUMA	Petaluma	H. WEBER
PLACER	East Auburn	H. M. COOPER
REDWOOD	Redwood City	E. W. FLORENCE
SACRAMENTO	Sacramento	C. W. MCKILLIP
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SAN JOAQUIN	Stockton	E. C. MONAHAN
SAN JOSE	San Jose	J. D. KUSTER
SANTA ROSA	Santa Rosa	M. G. HALL
SOLANO	Dixon	C. E. SEDGWICK
STANISLAUS	Newman	W. A. WIDENMANN
STOCKTON WATER	Stockton	J. W. HALL
VALLEJO	Vallejo	A. J. STEPHENS
YOLO	Woodland	W. E. OSBORN



PACIFIC GAS AND ELECTRIC COMPANY

CITIES AND TOWNS SUPPLIED WITH GAS,
ELECTRICITY, WATER AND RAILWAY

SERVICE FURNISHED	NUMBER OF CITIES AND TOWNS SERVED BY COMPANY			TOTAL POPULATION
	DIRECTLY	INDIRECTLY	TOTAL	
Electricity.....	126	49	175	1,221,218
Gas.....	48	2	50	1,123,068
Water (Domestic).....	1	11	19	58,690
Railway.....	1	..	1	75,602

Place	Population	Place	Population	Place	Population
Alameda.....	27,000	⁶⁴ Gold Run.....	100	¹ Piedmont.....	1,720
⁶⁴ Albany.....	800	⁶⁴ Grass Valley.....	4,500	¹ Pike City.....	200
⁶⁴ Amador City.....	200	⁶⁴ Gridley.....	1,800	¹ Pine.....	1,500
⁶⁴ Allegany.....	200	⁶⁴ Grimes.....	250	¹ Pittsburg.....	2,372
⁶⁴ Alviso.....	200	⁶⁴ Groveland.....	125	¹ Pleasanton.....	2,000
⁶⁴ Angel Island.....	280	⁶⁴ Guerneville.....	500	¹ Port Costa.....	600
⁶⁴ Atherton.....	250	⁶⁴ Hammononton.....	500	¹ Redwood City.....	3,200
⁶⁴ Auburn.....	2,375	⁶⁴ Hastings.....	4,000	⁶⁴ Richmond.....	10,000
⁶⁴ Avard.....	100	⁶⁴ Hillside.....	1,000	⁶⁴ Rio Vista.....	884
⁶⁴ Alvarado.....	900	⁶⁴ Hollister.....	3,000	⁶⁴ Rocklin.....	1,000
⁶⁴ Antioch.....	3,000	⁶⁴ Ignacio.....	100	⁶⁴ Rockville.....	2,600
⁶⁴ Arboga.....	500	⁶⁴ Irvington.....	900	⁶⁴ Rodeo.....	500
⁶⁴ Barber.....	350	⁶⁴ Jackson Gate.....	100	⁶⁴ Ross.....	500
⁶⁴ Belmont.....	800	⁶⁴ Jackson.....	2,045	⁶⁴ Russell City.....	750
⁶⁴ Ben Lomond.....	1,000	⁶⁴ Scotfield.....	250	⁶⁴ Sacramento.....	25,602
⁶⁴ Belvedere.....	3,360	⁶⁴ Knights Landing.....	350	⁶⁴ San Andreas.....	100
⁶⁴ Berkeley.....	53,000	⁶⁴ Knightsen.....	125	⁶⁴ San Anselmo.....	1,500
⁶⁴ Biggs.....	750	⁶⁴ Lafayette.....	100	⁶⁴ San Bruno.....	1,500
⁶⁴ Bolinas.....	500	⁶⁴ Live Oak.....	200	⁶⁴ San Carlos.....	100
⁶⁴ Brighton.....	100	⁶⁴ Livermore.....	2,250	⁶⁴ San Francisco.....	530,000
⁶⁴ Broderick.....	200	⁶⁴ Los Gatos.....	3,000	⁶⁴ San Jose.....	37,946
⁶⁴ Burlingame.....	4,300	⁶⁴ Larkspur.....	600	⁶⁴ San Leandro.....	4,000
⁶⁴ Camp Meeker.....	600	⁶⁴ Lincoln.....	1,400	⁶⁴ San Lorenzo.....	100
⁶⁴ Campbell.....	1,000	⁶⁴ Loma Park.....	100	⁶⁴ San Mateo.....	6,500
⁶⁴ Centerville.....	13,000	⁶⁴ Los Altos.....	500	⁶⁴ San Quentin.....	2,500
⁶⁴ Chico.....	150	⁶⁴ Loomis.....	400	⁶⁴ San Rafael.....	6,000
⁶⁴ Collinsville.....	150	⁶⁴ Madison.....	250	⁶⁴ San Pablo.....	1,000
⁶⁴ Colma.....	3,500	⁶⁴ Madrone.....	125	⁶⁴ Santa Clara.....	6,000
⁶⁴ Concord.....	1,500	⁶⁴ Martinez.....	5,000	⁶⁴ Santa Cruz.....	16,000
⁶⁴ Cement.....	1,500	⁶⁴ Martell.....	150	⁶⁴ Santa Rosa.....	10,500
⁶⁴ Colfax.....	500	⁶⁴ Marysville.....	1,500	⁶⁴ Sebastopol.....	1,200
⁶⁴ Cordelia.....	150	⁶⁴ Mayfield.....	7,000	⁶⁴ Sausalito.....	2,500
⁶⁴ Corte Madera.....	350	⁶⁴ Menlo Park.....	1,500	⁶⁴ Sheridan.....	130
⁶⁴ Crockett.....	2,500	⁶⁴ Meridian.....	300	⁶⁴ Smartsville.....	500
⁶⁴ Crow's Landing.....	375	⁶⁴ Millbrae.....	300	⁶⁴ South San Francisco.....	2,500
⁶⁴ Daly City.....	250	⁶⁴ Mill Valley.....	300	⁶⁴ Stanford University.....	2,000
⁶⁴ Danville.....	250	⁶⁴ Milpitas.....	2,500	⁶⁴ Sonoma.....	1,200
⁶⁴ Davis.....	750	⁶⁴ Mission San Jose.....	500	⁶⁴ Stege.....	1,000
⁶⁴ Decoto.....	350	⁶⁴ Mokelumne Hill.....	150	⁶⁴ Stockton.....	35,000
⁶⁴ Dixon.....	1,000	⁶⁴ Morgan Hill.....	150	⁶⁴ Suisun.....	1,200
⁶⁴ Davenport.....	1,000	⁶⁴ Mountain View.....	2,500	⁶⁴ Sutter City.....	1,500
⁶⁴ Durham.....	500	⁶⁴ Mt. Eden.....	200	⁶⁴ Sutter Creek.....	1,500
⁶⁴ Dutch Flat.....	500	⁶⁴ Mare Island.....	500	⁶⁴ Sunnyvale.....	1,500
⁶⁴ Duncan's Mills.....	150	⁶⁴ Napa.....	7,500	⁶⁴ Tiburon.....	400
⁶⁴ Edenvalle.....	500	⁶⁴ Nevada City.....	2,700	⁶⁴ Towle.....	100
⁶⁴ Eldridge.....	500	⁶⁴ Newark.....	700	⁶⁴ Vacaville.....	1,200
⁶⁴ Elmira.....	150	⁶⁴ Newcastle.....	700	⁶⁴ Vallejo.....	13,600
⁶⁴ El Verano.....	400	⁶⁴ Newman.....	750	⁶⁴ Vineburg.....	200
⁶⁴ Emeryville.....	5,000	⁶⁴ Niles.....	1,000	⁶⁴ Walnut Creek.....	350
⁶⁴ Encinal.....	100	⁶⁴ Novato.....	800	⁶⁴ Warm Springs.....	200
⁶⁴ Fairfax.....	500	⁶⁴ Oakland.....	215,000	⁶⁴ Watsonville.....	4,500
⁶⁴ Fairfield.....	834	⁶⁴ Ocidental.....	400	⁶⁴ Whitland.....	1,400
⁶⁴ Forestville.....	100	⁶⁴ Orange Vale.....	100	⁶⁴ Winters.....	1,200
⁶⁴ Felton.....	300	⁶⁴ Palo Alto.....	6,300	⁶⁴ Woodland.....	5,500
⁶⁴ Fresno.....	40,000	⁶⁴ Pacheco.....	250	⁶⁴ Woodside.....	200
⁶⁴ Folsom.....	1,500	⁶⁴ Penryn.....	250	⁶⁴ Yolo.....	400
⁶⁴ Gilroy.....	2,000	⁶⁴ Patterson.....	300	⁶⁴ Yuba City.....	1,200
⁶⁴ Glen Ellen.....	500	⁶⁴ Penn Grove.....	300	Total.....	1,228,218
		⁶⁴ Petaluma.....	5,500		

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— Gas only.

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Construction

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J. G. White Engineering Corporation

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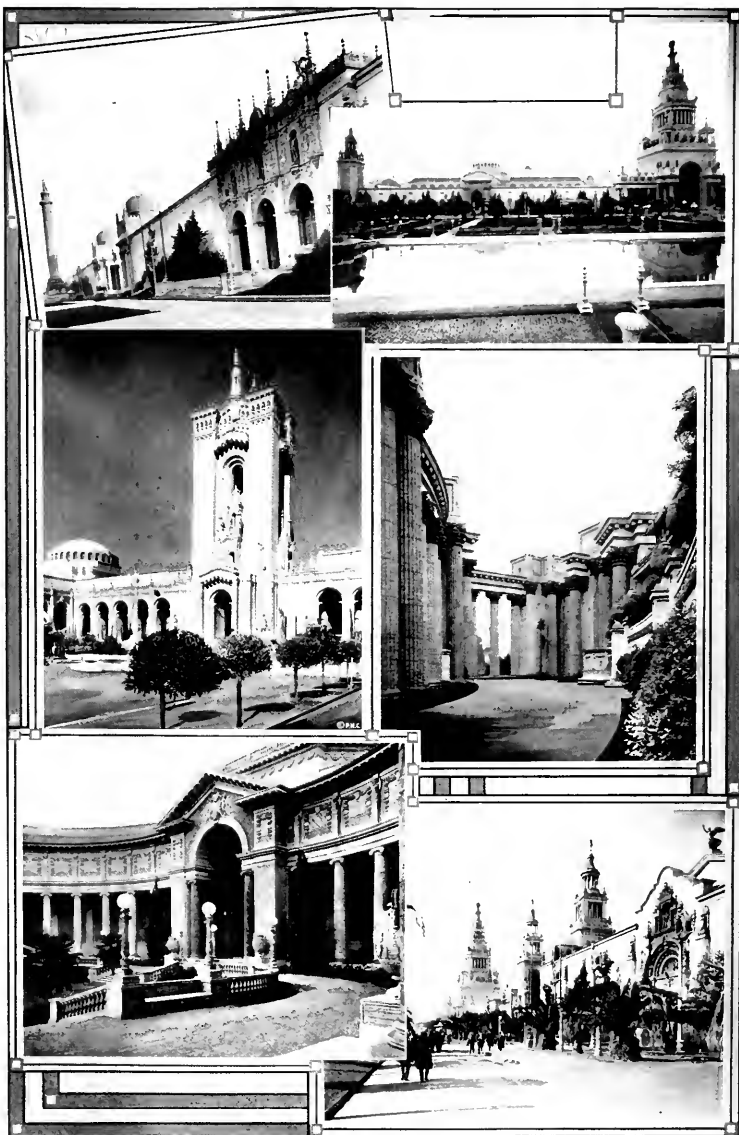
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Contents for February

STRUCTURAL BEAUTIES OF THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION	<i>Frontispiece</i>
PANAMA-PACIFIC INTERNATIONAL EXPOSI- TION OPENS WIDE ITS GATES TO THE WORLD	291
"PACIFIC SERVICE" SUBSTATION EQUIP- MENT TO FACILITATE SERVICE OF ELECTRICITY TO THE EXPOSITION.	<i>R. Dolson</i> . . . 297
ITEMS OF PERSONAL INTEREST	300
THE BEST CONTROL OF PUBLIC UTILITIES	<i>F. G. Baum</i> . . . 301
ALL BUILDINGS SHOULD BE PIPED FOR GAS	313
EDITORIAL	<i>F. S. Myrtle</i> . . . 314
THE CALIFORNIAN'S RETURN	316
TIDINGS FROM TERRITORIAL DISTRICTS	318
ACTIVITIES OF "PACIFIC SERVICE" TEN- NIS CLUB	<i>E. B. Henley</i> . . . 322
POSSIBILITIES—SUGGESTED BY THE RECENT WEATHER CONDITIONS	<i>H. B. P.</i> 322
DOINGS OF "PACIFIC SERVICE" SECTION, N. E. L. A.	<i>E. B. Price</i> . . . 323
GET BUSY, YOU ATHLETES, GET BUSY!	<i>The Committee</i> . . 324

Index to Advertisers

Allis Chalmers Mfg. Co.	ii	Pierson, Hoeding & Co.	vi
Associated Oil Co.	iii	Roedling's, John A., Sons Co.	vii
Bonbright, William P., & Co.	i	Schaw-Batcher Co.	viii
Byron Jackson Iron Works	v	Sprague Meter Co.	iii
Chaplin-Fulton Mfg. Co.	vii	Standard Underground Cable Co.	vii
General Electric Co.	ix	Steiger & Kerr Stove & Foundry Co.	vi
General Gas Light Co.	ii	Wagner Electric	vii
Halsey, N. W., & Co.	4th page cover	Western Engineering Publishing Co.	iii
Johns-Manville, H. W., Co.	v	Westinghouse Electric & Mfg. Co.	x
Pacific Telephone & Telegraph Co.	2d page cover	Welsbach Company	iv
Patrick & Co.	viii	White, J. G., Engineering Corporation	2d page cover
Pelton Water Wheel Co.	viii	Wood, R. D., & Co.	v



Structural beauties of the Panama-Pacific Exposition. Reading downward, left to right:
 View of the Esplanade, showing facade of Palace of Agriculture; looking across South
 Gardens to Tower of Jewels; tower in Court of Abundance; corridor of Palace of
 Fine Arts; doorway in Court of Palms; looking west along Avenue of Palms,
 Varied Industries Building in foreground.

Panama-Pacific International Exposition Opens Wide Its Gates to the World

WHEN the Congress of the United States, in 1911, designated San Francisco as the scene of the country's celebration of its achievement of the greatest engineering feat in history, the Panama canal, not only San Francisco but the whole state of California rose to the occasion and determined to play the part of hostess to the world in a manner befitting so great an opportunity.

The opportunity is here, the long period of waiting is over, the Panama-Pacific International Exposition is an accomplished fact. The Exposition builders await the world's verdict, confident, however, in their anticipation that the verdict will be one of unqualified congratulation.

The Exposition has been described by more than one special writer as a thing of superlatives. That it will be pronounced beautiful beyond compare goes without saying, for its location on the most picturesque slope of San Francisco bay, within view of the Golden Gate and facing the majestic hills of Marin, is unrivaled, while surely no world's fair among those that have gone before ever nestled in a tropical garden of matchless coloring such as Wizard John McLaren has prepared to meet the astonished gaze of our visitors from the East and abroad. That it is superlative in its artistic conception has already been declared by world's experts who have visited the scene and have watched the play of the sunlight upon the tinted domes that crown its marble-like structures.

Now as to details. The total area of the grounds, including a portion of the United States military reservation, known

as the Presidio, is 635 acres. Much of this area was a stretch of marsh and tideland, and the first great Exposition task was to fill this space in and render it suitable for the buildings. To accomplish this some 2,000,000 yards of material were pumped in from the bottom of the bay. To the casual Exposition visitor it will be almost inconceivable that the site of the stately palaces and wide stretching courts and gardens was, only two years ago, a marshy expanse of waste land.

The exhibit palaces of the Exposition are twelve in number. Eight of them form what is known as the main group, being interconnected by courts and colonnades, and virtually forming one great building. These buildings are: The Palaces of Varied Industries, Mines and Metallurgy, Transportation, Manufactures, Liberal Arts, Agriculture, Food Products and the Palace of Education and Social Economy. Flanking the east end of the main group is the Palace of Machinery; flanking the west, but detached by a wide lagoon, is the Palace of Fine Arts. In the South Gardens, which extend along the southern wall of the main group, are the Palace of Horticulture and Festival Hall. Another Exposition building, known as the Exposition Memorial Auditorium, has been erected in San Francisco's Civic Center, in the heart of the city. During 1915 this building is to be used chiefly as the scene of the three hundred or more conventions that are to be held in connection with the Exposition. After the Exposition it is to be turned over to the city for use as a civic forum.

There are forty-two foreign nations



Palace of Horticulture from
South Gardens.



Corner of Transportation Building
facing on Court of the Universe.

and forty-three states and territories participating. These nations are: Argentine, Austria, Australia, Bolivia, Brazil, Bulgaria, Canada, Cuba, China, Chili, Costa Rica, Denmark, Dominican Republic, Ecuador, Greece, Guatemala, Haiti, Honduras, Holland, Italy, Japan, Liberia, Monaco, Nicaragua, Newfoundland, New Zealand, Norway, Panama, Persia, Peru, Portugal, Roumania, Salvador, Servia, Siam, Spain, Sweden, Switzerland, Turkey, Uruguay, Venezuela. To these forty-two nations may be added Great Britain and Germany, through their industrial exhibits, and the Ibero-American League which is erecting a pavilion to represent Spanish speaking countries.

There are forty-three states and territories counted as participants, and these

are: Alabama, Arizona, Arkansas, California, Colorado, Delaware, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Mississippi, Montana, Nebraska, Nevada, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Philippines, Rhode Island, South Carolina, Tennessee, Texas, Utah, Washington, West Virginia, Wisconsin, Wyoming.

Of the foreign nations more have pavilions at the 1915 Exposition than were erected at any other exposition. There are twenty-two of these pavilions. Of the participating states and territories twenty-nine have buildings. The highest appropriation of the participating nations



Tower of Jewels and Festival Hall,
from Palace of Horticulture.



Italian towers at entrance of
Court of Flowers.

is that of Argentine Republic, which is \$1,300,000. California leads the states with an outlay of \$2,000,000 on the California building. Both Argentine and California set records for nations and states in the amount of money expended in participation at a world exposition. These structures built by the states and nations are rich in interest. Some are merely attractive structures built to be the center of the state or nation's activities and the home of the many social activities. Others are reproductions of famous places and combine education with entertainment and service. As examples may be considered:

The pavilion erected by Denmark, which is a reproduction of Hamlet's castle, the famous Kronberg castle at Elsinore. Across the street from this building is the reproduction of the Palais de Legion d'Honneur which is being erected by France. Not far away is the little Chinese community with its representation of one of the temples of the Forbidden City. Japan, like China, has used native labor and in the center of the Japanese gardens that were brought from Nippon, complete in every detail, is a copy of the temple of Kinkakuja at Tokyo. And in this interesting manner have the other nations built. If they have not given a famous reproduction they, at least, have been true to architectural ideals of their countries.

Among the states Oregon has a rustic Parthenon; Virginia has given Mount Vernon and fitted it with furniture used by George Washington; Maryland has brought the little brick home of Charles G. Carroll, one of the signers of the Declaration of Independence, and, so that the appearance of age may be convincing, a special preparation has been spread over the brick walls. Trenton barracks, the headquarters of George

Washington before he crossed the Delaware, is on the bay front as the building of New Jersey, and this is a true presentation even to the flag staff surrounded by the iron picket fence. Ohio, Illinois and Massachusetts have built copies of their state houses. California has built a charming mission, New York has a Fifth Avenue mansion and the other states have buildings that have their appeal.

To the east of the exhibit palaces lies



Entrance to the Palace of Education.

the concessions district, covering sixty-nine acres of ground. The concessions street is known as the "Zone" and contains the amusements selected from more than 7000 applications for space and proposals for entertainment enterprises.

The state and foreign section covering forty-two acres is to the west of the exhibit palaces, and still beyond them, the twenty-four acres of live stock section and thirty-seven acres covered by the aviation and athletic fields and mile-long race track.



The Palace of Education, showing the half-dome of Philosophy.

In all, nearly two hundred buildings go to make up the Exposition city.

For the extensive gardens, surrounding the exhibit palaces, the flora of every region has been drawn upon. The climate of California makes it possible to keep the grounds in continual bloom throughout the ten months of the Exposition, from February 20th to December 4th. With this purpose in view there will be a succession of plantings, one variety being removed, as soon as it has blossomed, to be succeeded by another.

The architecture of the Exposition in general tone is decidedly Oriental. This effect is particularly marked in the succession of lofty domes that mark the centers of the several exhibit palaces. It is in the portals of the buildings and the decoration of the several courts that the various architectural periods find representation. Although the buildings are the work of separate individuals there is an harmonious similarity throughout the

grounds that is enhanced by the uniform color scheme.

The predominating note of all of the Exposition buildings is in the effect given by the imitation Travertine marble of which they are constructed. This material, which faithfully reproduces the marble of the buildings of ancient Rome, is of a soft ivory tint that is restful to the eye, even in the most glaring sunshine.

The Panama-Pacific is the first exposition to have a comprehensive color scheme. The vast expanses of white wall-space that have been a more or less unpleasant feature of other expositions are here totally absent. In fact there will not be a single object of flat white upon the grounds. The color scheme is the creation of Jules Guerin, the illustrator and painter. Its principal tones are burnt orange, Venetian red, Pompeian red, cerulean blue, vert antique, sienna and various pastel tints especially



A. Stirling Calder, Chief of Sculpture.

selected for exposition purposes. Every detail of the Exposition has been made to conform to the color scheme (excepting possibly some of the gayer edifices of the "Zone"), even to the uniforms of the exposition guards who police the grounds.

The decoration of the buildings and courts has been greatly enhanced with a profusion of sculpture and a number of mural paintings by ten of the leading mural artists of the country. The sculptural decoration is arranged in an orderly sequence commencing at the main entrance of the grounds, which is marked by the 435-foot Tower of Jewels, and extending throughout the courts and gardens. More than one hundred separate works go to make up the exposition sculpture.

One of the chief features of the Exposition is the illumination system, embodying many new departures and methods, originated for the Exposition and hitherto untried in the illumination field.

W. D'A. Ryan, of the General Electric

Company, who was in charge of the Hudson-Fulton celebration's illumination, was told to design the best illumination scheme possible to carry out. Ryan looked to the stage for his inspiration and decided that a system that would flood the Exposition without offering to the eye the glare of the sources would be best. He determined that the searchlight should have an important part in his scheme, and, as a result, there are more than 500 searchlights installed over the Exposition grounds in addition to the new nitrogenous arc lamps that are hidden by gaily colored banners and in addition to the hundreds of other lamps that are protected by novel designs.

Never has a city been lighted as this wonder city and the tests that have been made in the past few weeks have aroused San Francisco and the bay cities to a high pitch of enthusiasm. The central feature of the night display is the much heralded "Tower of Jewels," 435 feet high and covered with 125,000 cut glass jewels. When the searchlights play on



Jules Guerin, Director of Color and Decoration.

this tower it becomes a great shaft of iridescence that defies description and can be understood only by one who has seen it.

Every court has its own illumination wonder and the great glass dome of the Palace of Horticulture is a veritable fairy palace at night when a special display begins to weave countless successions of sprites and wraiths on this giant "soap bubble."

A battery of forty-eight searchlights has been installed out in the bay on a reproduction of Morro Castle. Each of these searchlights is three feet in diameter and at night they paint the rainbow on the clouds that hang over the Exposition and San Francisco.

No exposition that aspires to first place among world celebrations can let the magnitude of other features dwarf the purely amusement side. Never has such emphasis been placed on clean fun as at the Panama-Pacific International Exposition. Inasmuch as the Exposition celebrates the opening of the Panama Canal a name for the amusement section was sought which should have a relation to the canal. This relationship was found in the sobriquet "The Zone." "The Zone" represents \$10,000,000 in fun. There were more than 6000 applications for concessions and a few less than 500 were chosen. Among the leading features of "The Zone" are "Toyland Grown Up," "The Grand Canyon of Arizona," "Yellowstone National Park," "Japan Beautiful," "The Submarines," "Evolution of the Dreadnaught," "Aeroscope," "London to the North Pole," "Samoan Village," "Australasian Village," "Tehautepec Village," "Narren Palast," "Dayton Flood," "Creation," "Panama Canal," "Old Nuremberg," and scores of others. Some of these concessions have been completed since May, 1914, and many of them have been open to the public since that time. The memories of "The Midway," "The Pike," "The Paystreak" and "The Trail" will be eclipsed when "The Zone" is in full swing.

If there has been a doubt in the minds of anyone as to whether or not the Panama-Pacific International Exposition will be successful it should be resolved in favor of success by the record of pre-exposition attendance. During the pre-exposition period the Panama-Pacific International Exposition receipts were \$471,234.06 more than those of the St. Louis exposition, and reached a total of \$679,383.37. The total number of admissions was 2,500,000 and the largest single day was 50,000.

The formal opening of the Panama Canal has been postponed until July but this postponement has not affected the opening of the Exposition. President Wilson will make his trip to San Francisco in March, as planned, and will go to the canal for the formal opening. After the opening of the canal the fleet of warships will proceed to San Francisco where it will form one of the great features of this wonderful Exposition.



The following extract from a letter from one of our large mining consumers in the Nevada district, will be of interest on account of the volume of the business and the freely expressed satisfaction of the consumer:

"January 20, 1915.

"During the fifteen years of operation we have paid your company and its predecessors upwards of \$100,000 for power and water. There have been no disputes or arguments, and payment of the money has been made with pleasure because we have had splendid service and prompt attention to our requirements."

A. B. Saurman, for the past twelve years Pacific Coast manager of the Standard Underground Cable Company, has been appointed Southeastern manager of the company, with headquarters in his native city, Philadelphia, Pa. and will return East in the early spring. John P. Bell will succeed A. B. Saurman as Pacific Coast manager. For the past eight years Mr. Bell has been the assistant secretary and treasurer of the company.

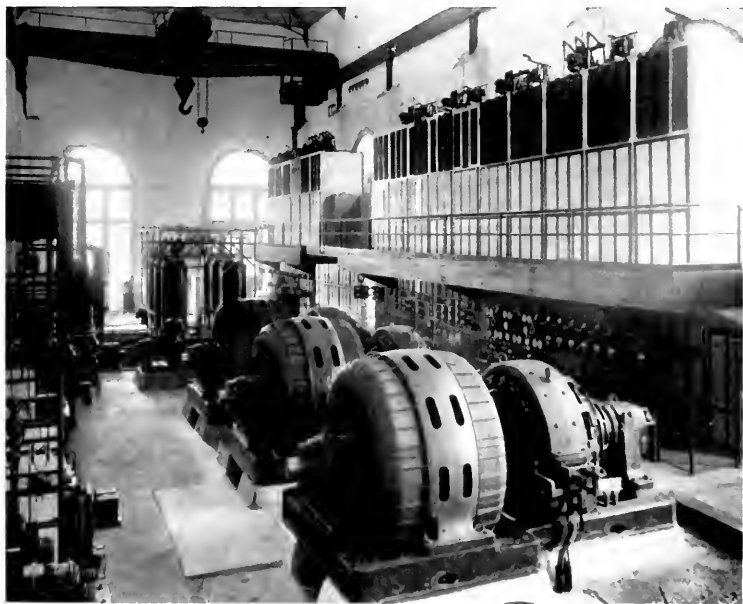
"Pacific Service" Substation Equipment to Facilitate Service of Electricity to the Exposition

By R. DOLSON, Assistant Superintendent of San Francisco Substations

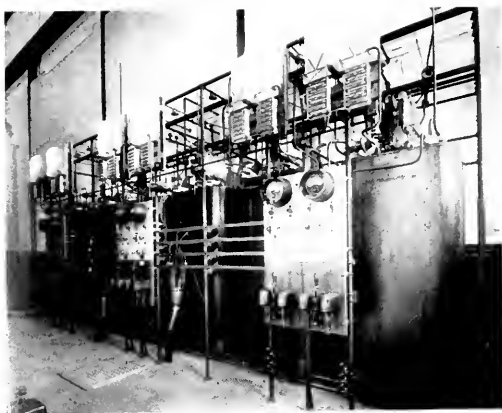
MUCH has been written of the wonderful illuminating and lighting effects to be produced at the Exposition but little has been said of the substation equipment to make it a success. "Pacific Service" met this need by building Substation F and rearranging Auxiliary F.

The main station is located in the west end of the Sierra and San Francisco Power Company's North Beach powerhouse on the edge of the Exposition grounds, east of Machinery Hall. The source of supply consists of three 4-phase 3-cond., 11,000-volt, 3-phase underground

cables direct from Station A, San Francisco, each capable of handling a load of 4000 K. W., and one No. 2 3-cond., 11,000-volt, 3-phase underground cable from Station D, San Francisco, and capable of handling 2000 K. W. This gives a total cable capacity of 14,000 K. W. In addition to this there is a 1,500,000 C. M. 3-cond., 11,000-volt, 3-phase cable tie from the Sierra and San Francisco Power Company's bus bar, which can be used in case of an interruption of service. The turbines of this station will be used as a stand-by plant as required



General view of equipment at Station "F" in the Exposition grounds at San Francisco.



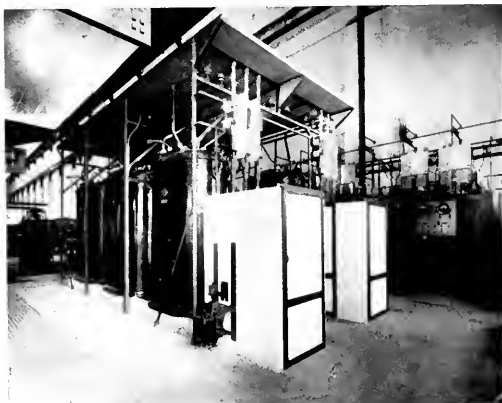
Series mercury arc rectifier sets at Station "F."

by our contract with the Exposition company. The transformer equipment consists of two banks, each bank being made up of three 1500 K. W. 11,000-volt primary, 2400-volt secondary General Electric transformers, giving a total capacity of 9000 K. W. These are connected delta on the high tension side and star on the low tension side, with the neutral brought out. The main feeder system consists of fifteen 4-phase 3-cond., 4150-volt, 3-phase feeders, which feed from the low tension bus bar directly into the Exposition grounds. These feeders are all carried from the station in underground conduit, and will be used for both light and power, but the distributing system is so arranged that light and power will not be taken off the same feeder. At the present time there are no automatic regulators installed on any of these circuits, but these are on hand and will be put in service if found necessary.

From the 11,000 volt bus

bar there is taken direct to the grounds to No. 2 3-cond. 11,000-volt 3-phase cable lines. One of these feeds direct to the Manufactures Building and the other to the Liberal Arts Building and the Scintillator. These cable lines are for furnishing the power necessary for the two 1000 K. W. motor generators and the two 250 K. W. balancer sets, which furnish the direct current for the battery of searchlights at the scintillator and the other searchlights which are used for lighting the Tower of Jewels.

For the series arc lighting there is installed seventeen General Electric series mercury arc rectifier sets. These sets are the combined unit type and are 75-light capacity at 6.6 amps. The six of these, which are installed in the main station, are wound for 2400 volts on the primary side. They are connected off the low tension bus bar between one leg and neutral, and will be used for the all-night lighting. The other eleven sets,

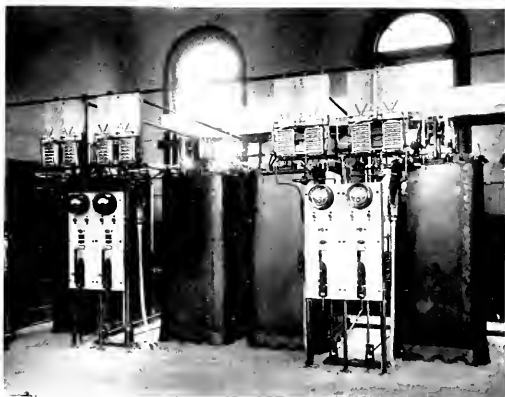


View of secondary side of transformer banks, showing 1,200-ampere, 1,000-volt switch compartments.

which are installed in the auxiliary station, are wound for 11,000 volts on the primary side. They are connected directly off a 11,000-volt cable which is run from the bus bar of the main station to the auxiliary station. These sets will be used only until midnight.

Auxiliary "F" is found in the company's old North Beach station, used by the Gas Department.

Due to the extension of the municipal car lines to the Exposition grounds it was necessary to install in the main station three 1000 K. W. Westing house motor generator sets. These sets consist of a 1440 H. P., 11,000-volt,



Series mercury arc rectifier sets in Auxiliary Station "F."
Picture shows one-half the installation.

3-phase synchronous motor and a 1000 K. W. 650-volt direct current generator. These machines generate the electric en-



Office of old North Beach gas works, adjacent to Exposition grounds. Now known to the electrical department of "Pacific Service" as Auxiliary "F."

ergy for the Van Ness avenue, Union street, Chestnut street and Columbus avenue car lines. The seven 1,000,000 C. M. railway feeder cables are carried out underground.

The switching arrangement on all the 11,000 volt cables and high tension side of the transformer banks consists of the latest type of General Electric Co. oil break H-3 switches. These are mounted on the gallery floor directly above the 11,000 volt bus bars, of which there are two sets. The connection between them is made through a system of selector disconnecting switches. The motor generator switches are the Westinghouse type E oil break. The 4150 V. feeder switches are the General Electric type K, oil-break, and are mounted in separate compartments in the basement just under the 4150 volt bus bars.

This bus is arranged in two sections

which are tied together through an oil switch. One transformer bank and an equal number of feeders are connected to each. The feeders are so arranged that the ones on the north section feed the buildings on the north side and the ones on the south section feed the buildings on the south side of the grounds. These can then be tied together through a system of tie cables which constitute a part of the Exposition distribution system so in case of trouble on one section of the bus, the cables on that end can be transferred to the cables on the other. All switches are remote control. The station is operated by at least two men on each watch, and an additional man on the evening peak. These men have been specially trained in the operation and wiring of the station by being with the work since it started, and are prepared to give "Pacific Service" at all times.

Items of Personal Interest

Mr. A. L. Wilcox, formerly an engineer with the company, was married January 10, 1915, to the daughter of the Belgian Minister at Lima, Peru.

Mr. Wilcox has been in Peru for two years installing a hydroelectric plant of 12,000 horsepower for the Cerro de Pasco Mining Company and made an enviable record, the plant being put into operation in about twelve months from breaking ground. The plant is located on "top of the world," the power-plant being at an elevation of 12,500 and "stepping up" to 15,000 feet.

Mr. F. G. Baum, under whose direction the plant was designed and constructed, promises that Mr. Wilcox on his return to San Francisco in March will describe in *PACIFIC SERVICE MAGAZINE* some of his experiences in Peru.

The marriage of Mr. S. J. Lisberger, our engineer of electric distribution, to Miss Carolyn Aronsohn of Baltimore, Md., took place in that city on January fourteenth. Only members of the families

and intimate friends were present. The marriage is the culmination of a friendship of many years standing, the bride having attended Goucher College while Mr. Lisberger was at Johns Hopkins University. Mrs. Lisberger has been a regular contributor to New York newspapers and magazines.

After a wedding trip through North Carolina and Southern California, the couple returned to San Francisco where they are making their home. "Pacific Service" extends hearty congratulations and best wishes.

The Civil Engineering and General Construction departments give forth the information that Mr. S. E. Carpenter is to be married to Miss Charlotte Donaldson, of Los Angeles, in June, and that Mr. Edward De Nike is to be married very soon to Miss Elizabeth Simmons of Cordelia. Both of the gentlemen concerned were extremely quiet about their courting, so that the news comes as a complete surprise and brings forth congratulations from all who know them.

The Best Control of Public Utilities

By FRANK G. BAUM

Presented at the joint meeting of San Francisco Section, A. I. E. E., and "Pacific Service" Section, N. E. L. A., San Francisco, Cal., January 22, 1915

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Abstract of Paper

The author states as an axiom that "the best control of a public utility is that which develops an eagerness and ability on the part of the company to furnish the service, and an equal eagerness and ability on the part of the consumer to purchase the service." Five elements requisite for the development of this eagerness and ability on the part of the company and the consumers are stated and analyzed.

One of the important elements is confidence in the company and its rates, and the author states his conviction that class rates are absolutely necessary for the best development of the business. All classes of consumers benefit by a diversified use of electric energy, which makes lower rates possible. The principle at the bottom of all rates is to make the plant earn all it can during every hour of the day so that the burden of the investment may be distributed. The same principle applies to nearly all public utilities, railroad, telegraph, express and postal service.

There is confusion in the minds of consumers because rates for power are lower than rates for electric lighting, and the electric energy for the two very different kinds of service is measured in the same units, kilowatt-hours. But in the similar case of railway service, there is no feeling that passengers should be carried as cheaply as freight, because it is realized that the two kinds of service are very different, and one is measured in passenger-miles and the other in ton-miles. Therefore the author urges the establishment of class rates for electric service as being more scientific than the methods in general use at present, and less likely to lead to misunderstanding. Examples are given to show that the lighting consumer's rate must be much higher than the power consumer's, because the investment and cost of operation to serve the former are greater than are required to serve the latter, and because, for the same peak demand, the total energy used by the power consumers is much greater than that used by the lighting consumers. The paper outlines the method for determining class rates for different classes of service.

The importance of having uniform class rates for a system or territory is shown, also the benefits derived from simplified rate-making and the stabilizing of rates, and bringing to the attention of the rate-making bodies the "value of the service" to the consumer. The necessity of offering an incentive to the companies to reduce the cost of service is also shown.

IT MUST be evident to anyone who has given serious consideration to the subject of the control of public utilities that it is necessary always to have in mind the following as an axiom:

The best control of a utility is that which develops an eagerness and ability on the part of the company to furnish the service, and an *equal* eagerness and ability on the part of the consumer to purchase the service.

Note that there must be both eagerness and ability on each side in order to promote the best interests of the business. Now how are we to determine the best way in which to develop this eagerness and ability on the part of the company and the consumer?

1. There must be developed a diversified use of electric energy.

2. Fair public service commissions must act as boards of arbitration between the company and the consumer.

3. The rate of return on the investment must be liberal.

4. There must be confidence in the company and its rates, and *class rates* are absolutely necessary for the development of the business.

5. There must be some incentive for the company to make economies in construction and operation.

It will be profitable to review these five

requisites in some detail and try to make clear some of the points now causing confusion in the minds of some consumers, investors and others.

(1) It is necessary for the company to know the possibilities of the use of electricity in its territory and incessantly encourage the use of this form of power throughout its territory. It need hardly be explained that the fundamental characteristic of electricity as an aid to human endeavor is that it can be produced at certain central points and distributed by means of electric wires throughout a tremendous area. It is thus carried to every place where power or light is needed, the original power being divisible into an infinite number of parts, each part performing its function at its proper place in a perfectly predetermined and efficient manner. Also it must be understood that electricity cannot be stored in large quantities, but must be produced the instant it is used.

It is also well to bear in mind that most labor or effort can be stated in terms of energy, and when power can be applied to displace physical energy there is almost always a very large gain in efficiency and especially in output. And always when the larger efforts required are done by power instead of by human labor, the result is a stimulation of other industries.

For example, when a railroad takes the place of teams for hauling between certain points, the cheaper method of hauling becomes a primary cause for the establishment of other industries which were not practical before the advent of the railroad. Similarly, cheap power in a district is generally a primary cause for the establishment of other industries not possible before the advent of cheap power. The result is that railroads and electric power lines, which, like steamship lines, are primary causes of the establishment of other industries and tend to promote general prosperity, should be encouraged, if not subsidized. Illustrations of the advantages to all consumers of a diversified business will be given under (4).

(2) In the determination of what is the best policy for a public service company, the question of the proper rates for different kinds of service is often a matter of contention between the company and the consumer, and as the service which a railroad or a power company furnishes is a natural monopoly, and competition does not promote the eagerness desired on the part of the consumer or of the company to purchase or furnish the service, the regulation of the rates is now generally delegated to public service commissions, which are really boards of arbitration, to determine what is for the best interests of the business, considering both the company and the consumer.

(3) In the determination of reasonable rates for service the commissions, in addition to the ordinary operation and maintenance expenses, take account of the capital invested, and capitalize the loss in interest covering the unproductive period during which the business was being established, and allow generally some capitalization of the going value of the business, the latter often being made up of a number of elements, some of which are difficult to determine with great exactness. The result is that rates are usually allowed liberally so as to leave no doubt of the above items, and quite generally when this is done there is no resort to the courts. The rate of return must, of course, depend on the risk, the character of the country, the stability of the business, and the economy of the manufacture of the power facilities.

While a rate of return is generally allowed for the initial period of a company's business, no extra return from business originating on new extensions

is generally allowed. The reluctance of companies to make extensions into new territory is largely due to this fact. As a matter of fact, all extensions into new territory should be treated as unprofitable for such period as is necessary for them to become paying, and a capitalization of the losses should be allowed the same as in the establishment of a new enterprise.

The amount of time necessary for a business to become remunerative may vary from one to ten years, and generally if one can start and produce a paying enterprise in five years it may be considered a success. If the earnings commence at zero and become remunerative at the end of six years, the loss in interest amounts to about 18 per cent of the investment. All unremunerative extensions should be treated in the same way, with the result that from 10 to 20 per cent capitalization should be allowed on the total investment in order to promote extensions by the established companies. Otherwise the result will be, if no allowance is made for extensions, that the established companies will not make extensions into new territory; but these will be undertaken instead by new companies which will be allowed to capitalize the loss in interest at a higher rate than the established companies. Extensions into new districts are extremely important, because we must not only consider those who enjoy the service, but those who would like to make use of the same service.

As an example, I have a ranch located thirty-five miles from the nearest railroad point. The Southern Pacific Company surveyed a line five years ago, but owing to general conditions has never built the line. Now, a reduction of freight or passenger rates to the valley farmers is no help to me; in fact, the reduction to the valley farmers may be one of the reasons I do not get railroad service. Moreover, I am not much concerned whether or not the rates to be charged me during the first ten years are 20 per cent higher than they will be later. What I want is railroad service and I am willing to pay high rates and a bonus to get it. The district has as much available land as the Imperial Valley and can support a railroad, but I and the other farmers do not get the railroad service because there is no incentive for the railroad to go into new territory.

All the early companies risked large sums in the early stages of the electrical business and this should not be lost sight of in fixing rates at the present time. A

certain manufacturing company at one time had a possible loss of about \$10,000,000 facing it before it made its type of steam turbine a success. The price at which turbines are sold must, of course, absorb this amount, but the gain in efficiency obtainable, of which the public gets the benefit, makes the \$10,000,000 insignificant. If the manufacturers are entitled to something for their risk, is not the electricity supply company that installed reciprocating engines to be replaced by turbines entitled to something for its risk? Usually we penalize the company and make it stand the loss on its books. Another manufacturing company stood to lose at one time about \$500,000 before the induction motor was made a success. It is certainly entitled to a large return for this risk, especially when we consider the enormous value of the induction motor to the world. Similarly the early transmission companies stood to lose the entire first investments made. And yet, in spite of the enormous value of this pioneer work, we hear many people who say there shall be a return only on the wise investment. Who is to judge what was a wise investment in water power twenty years ago?

The pioneers in hydroelectric developments who risked large sums should be given credit for some of the enormous benefits derived by the public as a result of water power development. It is entirely safe to say that in California the profits to the consumers, from the savings of this form of power, is yearly greater than the total annual gross earnings of the hydroelectric companies.

(4) If all classes of service were of the same kind there would be little difficulty in arriving at rates that would satisfy the company and the public, but where the same service is used for various purposes, the rates for the service vary, the public is confused and generally considers that it is being treated unjustly. For example, a man using electricity to light his residence pays a rate of say ten cents per kilowatt-hour, but a man who uses electric power to run an ice plant may get a rate of one cent per kilowatt-hour, and usually no amount of explanation will convince the man paying a rate of ten cents that he is not being robbed. On the other hand, the man paying the one-cent rate knows that he is getting only a fair rate and the power company is certain both of them are being treated fairly. Because of the confusion that exists in the minds of the

consumers many power companies, especially those supplying lighting to many eastern cities, do not encourage the use of electricity for power, because they believe the lighting consumers will think they should have the same rates, or at least lower rates than are warranted. As a matter of fact, a thorough understanding on the part of the consumer and the offering of the electric service for all purposes, especially for power will result not only in some reduction in rates to the lighting consumers, but what is much more important, the use of electricity for power purposes will stimulate other industries and these will, of course, make the community more prosperous. A prosperous community or individual is never burdened by the lighting bill, as it is insignificant when measured in terms of the service received and the general benefits derived by the community when it has an ample power supply available and used for all purposes.

Electricity for lighting and power purposes cannot be stored in any large quantities, therefore the plant must at each instant generate the total supply. The lighting consumer must, therefore, have available all day the possibility of instant service, but he may only use the service to produce revenue for the company a few hours each evening. This is the usual explanation given for the higher rates charged for lighting, that is, that the lighting consumer uses the light only a few hours per day, whereas the power user's service extends over the larger part of the day, and also the power consumer uses a much greater quantity. The revenue obtained from a consumer having a 100-h. p. motor may be equal to that obtained from a hundred or two hundred lighting consumers, and herein lies the crux of the entire matter, but the consumer does not see it, so we will try another way of explanation.

If, for example, the total of investment and operating expense to serve all the lighting consumers is equal to the total of investment and operating expense to serve all the power consumers, then plainly the revenue derived from each class of service must be the same in order that each may bear its fair share of the expense of the service. In the average up-to-date light and power system the total energy, generally expressed in kilowatt-hours, consumed by the lighting consumers is very much less than the kilowatt-hours consumed by the power consumers. If the power consumers use five

times as much as the lighting consumers, then, on the assumption that it costs as much to serve all the lighting consumers as it does all the power consumers, the rate per kilowatt-hour charged the lighting consumers must be five times as large as the rate charged the power consumers. Generally, however, especially when water power is available, and on account of the large cost of distribution, the cost of serving the lighting consumers is greater than the cost of serving the power consumers, so that a greater difference than five to one must exist in the rates for service.

To use a parallel case for illustration, let us take the railroad service and compare the cost of hauling passengers and freight. Transcontinental freight is hauled by the railroads from the East to California at about \$1.50 per 100 pounds. To haul 300 pounds or about the weight to be hauled when one passenger and his baggage is carried, will give the railroad a revenue of \$4.50. The revenue derived, however, for hauling a single passenger over this distance is more than ten times this amount, and yet the passenger pays only his fair share of the expense. Again, local freight is hauled at one cent and two cents per ton-mile, whereas the passenger pays two to three cents per passenger-mile; that is, the passenger pays more to be hauled one mile than is charged to haul a ton of freight one mile. The classes of service and the basis of charge are here entirely different, hence there is no confusion in the minds of the public.

Again, a railroad devotes, let us say for simplicity of explanation, one-half the railroad investment and one-half the operating costs to freight service and the other half to passenger service. In that case plainly the freight revenue and passenger revenue must be equal in order to be equitable. But the railroad may haul 1,000,000,000 tons of freight at an average return of one cent per ton-mile, producing \$10,000,000 in earnings, and only carry 400,000,000 passengers one mile. Clearly, in order to produce the same revenue from the passenger as from the freight service, it must receive an average rate of two and one-half cents per passenger-mile. On a ton-mile basis in the illustration the passenger pays about twenty times the rate per ton-mile paid for the freight service. And yet there is no confusion in the minds of the public in this instance, mainly because the same unit of charge is not used. If the rail-

roads attempted to put the passenger business on the same basis as the freight, that is, weigh the passenger and charge so much per ton-mile, as in the case of freight, the public would think it was being robbed, but, as a matter of fact, the rates are equitable.

As a matter of equity the passenger-mile rate for service is proper and logical and so is the ton-mile rate for freight. Passenger business is a personal service and paid for on a different unit basis and not on a ton-mile basis as freight is hauled.

Now, a similar difference exists in the lighting and power service which brings to the minds of the public the confusion as to the reason for the difference in rates for lighting and power.

Plainly if, for illustration as before, we assume that the investment cost and operation cost of supplying energy for power consumers is the same as the cost for supplying the lighting consumers, it follows that the revenue derived from the two classes of business should be the same. But if the total energy consumed by the power consumers is five times that used by the lighting consumers, it is evident that the average rate charged per kilowatt-hour for lighting must be five times the average rate charged for power. That is, if the average rate for power is one cent per kilowatt-hour, the average rate for lighting must be five cents per kilowatt-hour. If the company sells 500,000,000 kilowatt-hours for power at an average rate of one cent, it will receive \$5,000,000 in revenue. But if the amount of energy supplied for lighting is only 100,000,000 kilowatt-hours the charge must be five cents per kilowatt-hour to produce the same revenue.

Always, however, on account of the cost of distribution, the cost of the lighting service is much greater than the cost of the power service, and generally, therefore, we find the lighting rates about ten times the rates for power service. The total investment in the given case, for illustration, may be divided as follows:

Investment for power consumers	\$15,000,000
Investment for lighting consumers, to substations	15,000,000
Investment for lighting consumers, for distribution	15,000,000

And the earnings necessary so that each may pay its fair share may be as follows:

From power consumers	\$3,000,000
From lighting consumers, to substations	3,000,000
From lighting consumers, for distribution	3,000,000
Total to be earned	\$9,000,000

The power consumers may use . . . 400,000,000 kw-hr.

The lighting consumers may use . . . 100,000,000 "

Fair rates would then be:

For power consumers, charges to substations:

$$\frac{300,000,000 \text{ cents}}{400,000,000} = 0.75 \text{ cent per kw-hr.}$$

For lighting consumers, charges to substations:

$$\frac{300,000,000 \text{ cents}}{100,000,000} = 3 \text{ cents per kw-hr.}$$

For lighting consumers, for distribution:

$$\frac{100,000,000}{100,000,000} = 3 \text{ cents per kw-hr.}$$

This would make the total average rate to the lighting consumer six cents per kilowatt-hour, and the total average rate to the power consumer three-quarters of a cent per kilowatt-hour. If the kilowatt-hours consumed for lighting are 150,000,000, the rate to the substation is two cents per kilowatt-hour, and the total rate four cents.

In the above explanation, which the consumer can understand, there is no use of the terms diversity factor and load factor. It puts lighting consumers in one class and power consumers in another, and determines average class rates from the cost of giving service and the amount of energy used by each class of consumer.

It is seen, therefore, that the lighting consumer's rate is much higher than the rate to the power consumer because:

(1st) The investment and cost of operation to serve the lighting consumer are greater than the investment and cost of operation to serve the power consumer, and

(2nd) Much more important, the total energy consumed by the power consumers is much greater than that used by the lighting consumers *for the same peak demand*.

The confusion that exists in the case of the lighting rates comes from charging for the same unit of service. In the freight and passenger rates there is a natural difference in the method of charging, hence there is no confusion. In the lighting and power business there is no such natural method of charging a different unit rate. It has been occasionally urged to charge the power user on a sliding scale of charges, starting at the same rate charged the lighting consumer. If the power consumer made the same demands as the lighting consumer, his rate and total charge would be the same as the lighting consumer up to the substation. The scale of rates charged the power consumer would drop rapidly in excess of this amount, and his average rate could be approximately the same as it would be under the ordinary power rate schedule. But there is objection to

this on the part of the power consumer. It is believed, however, that until some form of schedule of rates or class rates is devised which strikes all consumers alike, there will be difficulty in educating the public as to the reason for the difference in the rates. It is believed that equitable "class rates" as herein described will remove the present misunderstanding.

That low average power rates are necessary for low cost of lighting service cannot be questioned, just as low freight rates are necessary in order to obtain low passenger rates. If an attempt were made, for example, to raise the freight rates per ton to nearly equal the passenger rates, there would be no freight, no business, and consequently no money and no passengers.

In the same way, low rates for power service are not only equitable, but absolutely necessary in these times in order to promote the industries of the communities. If we should attempt to raise the rates to the power consumers, the lighting consumers would soon disappear, as business would become stagnant, because in this modern day general power and low rates are necessary in order to make a prosperous community.

Similarly, the reason for the difference in the "class rates" for commercial and residence lighting may be explained. For example, in order that the commercial and residence lighting may pay equitable proportions, let

Power earnings necessary for commercial lighting	= \$1,000,000
Power earnings necessary for residence lighting	= 2,000,000
Distribution earnings necessary for commercial lighting	= 1,000,000
Distribution earnings necessary for residence lighting	= 2,000,000
Suppose commercial consumers use:	
50,000,000 kw-hr. per year	
And residence consumers use:	
50,000,000 kw-hr. per year	
From this we obtain:	
Average power charge, commercial	= 2 cents per kw-hr.
Average power charge, residence	= 4 " " "
Average distribution charge, commercial	= 2 " " "
Average distribution charge, residence	= 4 " " "
Total average charge, commercial lighting	= 4 " " "
Total average charge, residence lighting	= 8 " " "

It will be noted that if the energy consumption is doubled the rate will be halved, if the total cost remains the same. There will be further differences between large and small commercial residence business, but these can be taken into account in a sliding scale. In the same way there will be reason for class rates for certain kinds of power business, depend-

ing largely on size of plant and the hours during which power is consumed, and a sliding scale of rates for each class of business.

The general method used in determining class rates for a system is as follows: Divide the total amount of money to be earned by the power and light class by the sum of the peak demands of the two classes. This gives the demand charge per kilowatt. Multiply this demand charge by the peak demand of the class. This gives the total revenue to be earned by the class. Divide this revenue by the kilowatt-hours consumed by the class and we obtain the average class rate per kilowatt-hour. An example of this will be given later, and is shown in Fig. 1.

The present general method of determining electric lighting rates is to begin at the consumer and add the cost of reading meter, billing, collecting, etc., to the distribution cost and to this add the cost of power. This is equivalent to what the railroads would do if they tried to determine passenger rates between two points by adding the cost of the sale of a ticket to the cost of the oil required to haul the passenger and to this then add the cost of passenger equipment and proportionate cost of the railroad system between the two points. This method is necessarily subject to errors and tends only to confuse, as it concentrates attention on the infinitesimal items.

Why is it not better to take all the passenger business and determine average class passenger rates for the entire system, by taking the entire cost of doing all the railroad business and dividing this cost among the various classes in proportion to the use of the facilities and operating expense of the different classes? Similarly, much more accurate and satisfactory results can, I believe, be obtained

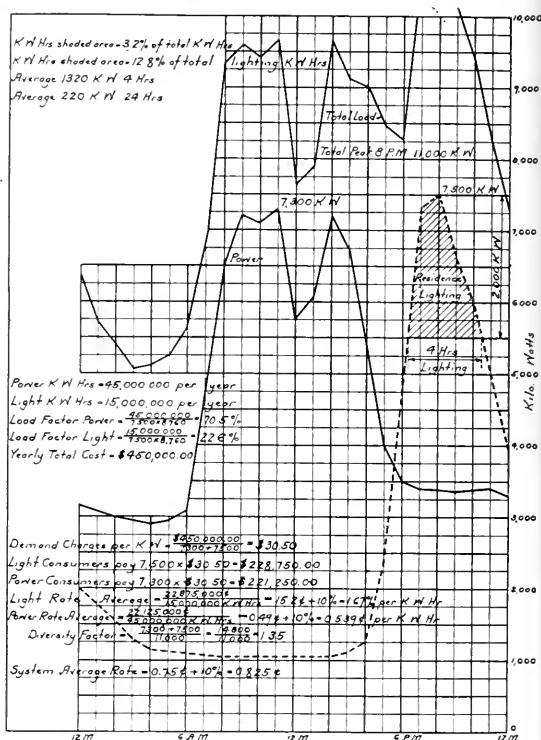


Fig. 1

Load curve—typical power system.

in determining electric rates by proportioning the earnings necessary to support the entire property between the different classes. The total earnings necessary to support the property can be determined, and the proportionate use of the facilities can be readily determined accurately enough for practical purposes. With these facts and the kilowatt-hour consumption of the different classes known, very fair class rates may be determined. In no other way can I see any satisfactory solution of the rate question, so that business in all its departments may be built up to the best advantage of all the classes of consumers.

The present method is too much like trying to arrive at the cost of raising chickens by "counting them before they are hatched." A safer and better way is

to take the actual results of some chicken ranches over a long enough period of years, so that instead of trying to figure the uncertainties and hazards of each item of the business they are all summed in the balance sheet.

As we have seen, the cost of railroad service per passenger-mile bears only the remotest relation to the cost per ton-mile for freight, and in a degree the same difference exists between residence lighting and power. Also, the cost of hauling a car of nails is about the same as a car of transformers, but the rate on nails is and must be lower for two reasons, (1) there are more nails hauled, and (2) the value of the service is greater in hauling a car of transformers than in hauling a car of nails. To get the nail business at all, the nails must be hauled at a lower rate, and the fact that they bring in revenue in excess of the cost, makes it possible to haul the transformers at a lower rate than could be done if the rate on nails were raised.

Similarly, the cost of electric lighting bears only the remotest relation to the cost of supplying power. Again, the cost of supplying power service to a sawmill or a planing mill must be lower than for supplying another class of factory. First, because the planing-mill man insists that if he gives us his power load he must make some profit, and we must therefore furnish cheap power or we do not get his business at all. Second, if we do not get the planing-mill business, although it may not be as profitable as some other lines of business, we must increase the rates to the other users in order to make up the revenue necessary to support the property. Hence it is generally to the advantage of the other lighting and power consumers that the company take on low class power consumers, if this business pays more than the operating expense and serves to reduce rates in general. Three things must be kept in mind regarding any new business:

First.—Some profit must be made for the consumer in order to get the business.

Second.—Some profit must be made for the company.

Third.—The tendency of the business taken on must be such as to cause a general lowering in rates as volume of business increases.

The early electric companies were organized to supply lighting. It was soon recognized that the plant could take on day power, and increase the net revenue, which meant, of course, that the invest-

ment was more efficiently used. As a result of the power business the rates for lighting have been materially reduced.

If some industry, for example, could be established to use the power service from, say, 12 p. m. to 7 a. m., very low rates indeed could be made to get this business. Any revenue added over operating expense would be so much revenue which could be subtracted from the charges to other consumers, hence even though the business had to be taken at less than one cent per kilowatt-hour, it would, from the standpoint of all consumers, be very profitable business for the company, as the earnings would be largely added to the surplus.

The initiation of the low-price night letters by the telegraph companies is an example of additions to the volume of business with the same equipment, tending to reduce the cost of telegraphic service generally.

An example will probably make this plain, although it is quite elementary to the managers of utility properties. Assume that we have installed a waterpower plant (no steam reserve) having a normal capacity of 10,000 kilowatts, and that it cost, including transmission line and substation, \$2,500,000. To make the example as simple as possible we will assume that the company contracts to supply the lighting of a city wholesale, so that the company shall earn 8 per cent on its investment in addition to the operation, depreciation and maintenance charges, etc. The total annual consumption, is, say, 15,000,000 kilowatt-hours. The consumer agrees to pay 10 per cent in excess of the rate determined from costs in order to have a margin of safety.

Then for the cost of service we have:

Interest	8 per cent	= \$200,000
Depreciation	1.5 per cent	
Maintenance	1.5 "	
Taxes and Insurance 1.0 "	4 "	100,000
Total	12 per cent	\$300,000
Operation and management		150,000
		\$450,000
Cost per kw-hr. =	45,000,000 cents	
	15,000,000 kw-hr.	= 3 cents per kw-hr.
Adding 10 per cent for safety margin	3.3 "	"

There is a daytime power load of 45,000,000 kilowatt-hours annually, available in the same town, that can be supplied from the same substation, with the same power plant and transmission system. However, in order to make a rate attractive enough to get the power load, it is agreed that the power consumer shall pay

only 6 per cent on one-half the investment, which necessitates that the lighting consumer pay 10 per cent. Each consumer agrees to pay 10 per cent in excess of the rate determined from absolute costs in order to have a margin of safety. The costs then chargeable to the lighting consumer will be:

Interest	10 per cent of one-half investment	\$125,000
Depreciation	1.5 per cent	
Maintenance	1.5 "	
Taxes, Ins., etc.	1.0 " 4 " " "	50,000
Total	14 "	\$175,000
One-half operation and management cost		75,000
Total charge to lighting consumer		\$250,000
25,000,000 cents		
15,000,000 kw-hr.		
Cost per kw-hr. = 1.66 cent per kw-hr.		
With 10 per cent added as margin of safety, rate = 1.833 cent per kw-hr		

The result to the lighting consumer is to reduce the rate from 3.3 cents to 1.833 cents per kilowatt-hour, in spite of the fact that his interest rate has been increased from 8 to 10 per cent.

The rate to the power consumer will be:

Interest	6 per cent of one-half investment	\$75,000
Depreciation	1.5 per cent	
Maintenance	1.5 "	
Taxes and Ins	1.0 " 4 " " "	50,000
Total	10 " " "	\$125,000
One-half operation and management cost		75,000
		\$200,000
Cost to power consumer per kw-hr. = 20,000,000 cents		
45,000,000 kw-hr.		
= 0.444 cent per kw-hr.		
10 per cent added for safety margin gives rate = 0.4888 cent per kw-hr.		

If now a consumer could be found to take the power from 12 p. m. to 6 a. m., when the other two consumers are not using it, a rate could be made by which his interest charge could be less than 6 per cent and still both the other consumers would benefit, as the operation charges would be increased very little.

Let us take now a typical case as applying to the above plant. The load curve in Fig. 1 may be assumed to represent such a case. Here we have the peak demand of the lighting class equal to 7,500 kilowatts and the peak demand of the power class of 7,300 kilowatts. As a result the yearly charges of \$450,000 are spread over $7,300 \div 7,500 = 14,800$ kilowatts, instead of being spread over the 11,000 kilowatts of the total peak. As a result the yearly demand charges are reduced from

$$\frac{450,000}{11,000} = \$41 \text{ (practically to) } \frac{450,000}{14,800} = \$30.50$$

or the demand charges are reduced practically to 75 per cent of what they would be if there were only one class of consumers. This shows the advantage of the diversity factor 1.35. Now charge each class in proportion to class peak demand (see calculations in Fig. 1). As a result the light consumers pay $7500 \times \$30.50 = \$228,750$ of the total and the power consumers pay $7,300 \times \$30.50 = \$221,250$ for power at the substation.

The average charge for lighting is

$$\frac{22,875,000 \text{ cents}}{15,000,000 \text{ kw-hr}} = 1.52 \text{ cent,}$$

and adding 10 per cent gives 1.67 cent per kilowatt-hour.

Similarly, the average power charge is

$$\frac{22,125,000 \text{ cents}}{45,000,000 \text{ kw-hr.}} = 0.49 \text{ cent,}$$

and adding 10 per cent gives 0.54 cent per kilowatt-hour.

Here we see the effect of the load factors; the lighting load factor being only 22.6 per cent, while the power load factor is 70.5 per cent. The average load factor is 62.5 per cent. Without the power consumer the rate to the lighting consumer would be

$$\frac{45,000,000 \text{ cents}}{15,000,000 \text{ kw-hr.}} = 3 \text{ cents,}$$

and adding 10 per cent gives 3.3 cents; or, in other words, the lighting rate is reduced nearly one-half. Without the lighting consumer the power rate would be 1.1 cent. The mutual benefit is clearly shown by the example.

If a town, for example, has a lighting peak of 100 kilowatts, the lighting consumers in that town must pay $\frac{100}{7,500}$ of the total paid by all the lighting consumers on the system. The rate per kilowatt-hour for the town will be determined by dividing the total to be paid by the kilowatt-hours consumed, and therefore the rate per kilowatt-hour depends on the consumers themselves, that is, on how much they consume.

The following table shows the effect of the power load in reducing the charges to the lighting consumer.

Case	Total Peak	Light Peak	Power Peak	Proportionate Charges	
				Light	Power
A	10,000	7,500	2,500	75 per cent	25 per cent
B	10,000	7,500	5,000	60 "	40 "
C	10,000	7,500	7,500	50 "	50 "

The lighting consumer pays 100 per cent of all power charges if there are no

other consumers, but by the addition of power consumers the lighting charges for power at the substation may be practically reduced one-half. From the substation to the consumer, of course, each class of consumer must bear its share of the additional expense.

There will be further differences of rates to different classes of lighting and power consumers, but the application of the principle is the same as in the above case. For the power consumers we start with the total amount to be earned by all the power consumers and by proportioning these charges according to the demands of the class, the total charge to the class is determined, and from the kilowatt-hours consumed by the class its average rate is determined. The method is believed to be scientific and can be made fair to all consumers under any circumstances.

Except for the cost of water storage, which should be apportioned to kilowatt-hour output, all charges on a water-power plant are demand charges and should be apportioned to peak demands of power and light classes. No argument is necessary to prove this is true.

In applying this method to a steam plant, all demand charges, that is, all plant investment and operation, would be proportioned to peak demand power and light, and fuel and water only be charged as energy and proportioned to kilowatt-hour consumption of the two classes.

The following would be a somewhat logical arrangement of class rates:

Class	Kind of Service
1	Residence lighting.
2	Commercial lighting, electric heating, etc.
3	Street lighting.
4	Industrial power or day power.
5	Power (24 hour).
6	Power, Railway.
7	Power, Irrigation.
8	Power, Reclamation.
9	Power, Off-Peak.
10	Power (10 a. m. to 6 p. m.)

It is not intended in this paper to go into the question of the proper rates under each class, but rather to limit the paper to a discussion of the general principles of class rates in such a way as to make clear to the consumer and the investor the necessity and justification for such rates, to the end that there will be a better understanding of the electrical business as an extremely important part of the economic development of any community.

The principle at the bottom of all rates is to make the plant earn all it can during every hour of the day so that the burden of the investment may be distributed.

That is, to make the rates within the reach of the lighting consumer, it is necessary to make low power rates in order to distribute the charges over as many kilowatt-hours as possible.

The same principles apply to nearly all public utilities. As a precedent for rates of this kind we have the railroad, telegraph, express and postal rates.

Generally the power service requires a steam reserve plant for service insurance, and usually, during periods of low water, storage water must be used and the steam reserve plant must be operated part of the time. It is evident that the cost of oil for the steam reserve and the cost of water storage, both representing energy, should be apportioned to the kilowatt-hours consumed by each class. In general, the total charges for power delivered to substations are made up in two items:

First.—Demand charges, which should include interest, maintenance, depreciation, operation and management.

Second.—Energy charges, which should include oil and water for steam reserve plant and the cost of storage water, as these are the only items that should be proportioned to kilowatt-hours output.

The total charges above would be divided for light and power classes into demand and energy charges, as follows:

Light class demand charge =

$$\frac{\text{total demand charge} \times \text{light peak}}{\text{light peak} + \text{power peak}}$$

Power class demand charge =

$$\frac{\text{total demand charge} \times \text{power peak}}{\text{light peak} + \text{power peak}}$$

Light energy charge =

$$\frac{\text{total energy charge} \times \text{light kw-hr.}}{\text{light kw-hr.} + \text{power kw-hr.}}$$

Power energy charge =

$$\frac{\text{total energy charge} \times \text{power kw-hr.}}{\text{light kw-hr.} + \text{power kw-hr.}}$$

Without taking into account the fact that it is the lighting consumer who demands most the service insurance of the steam reserve and who uses the steam reserve inefficiently because it is only used a few hours per day, let us make a few general figures to see what the steam reserve adds to the energy costs of the two classes over those shown by the example in Fig. 1.

Let us assume that the low-water period is three months, or one-quarter of the total kilowatt-hours must be supplied by steam power or its equivalent storage water. Let us assume the cost of fuel and

water for the steam reserve plant is 0.4 cent per kilowatt-hour and allow the same per kilowatt-hour for the storage water. Then 15,000,000 kilowatt-hours, or one-quarter of the total, must come from storage water or steam power, making a total of \$60,000 per year. This will add 0.1 cent per kilowatt-hour to the total and to each class of consumers' rates, the final rate then being 1.77 cent for the lighting and 0.64 cent for the power.

Adding this 0.1 cent per kilowatt-hour, the average rate for power at the substation in the above example is:

$$\frac{45,000,000 \text{ cents}}{60,000,000} + 0.1 \text{ cent} = 0.75 + 0.1 = 0.85 \text{ cent,}$$

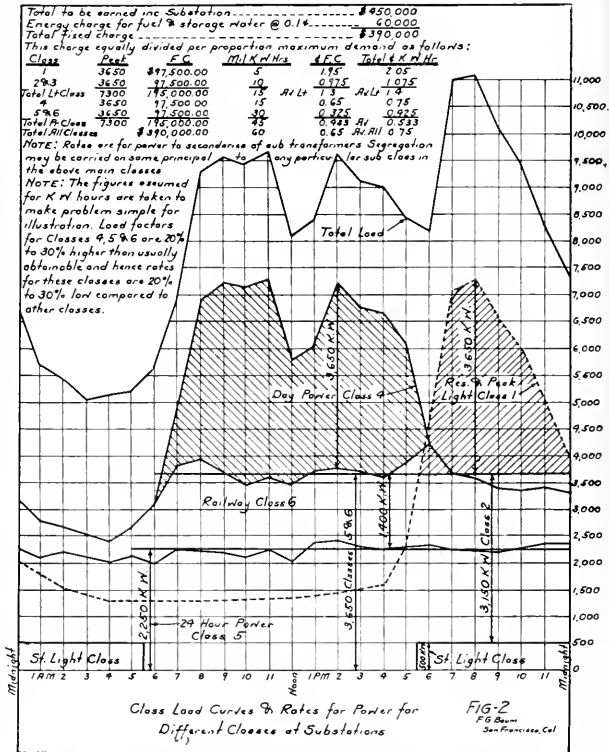
and adding the 10 per cent for margin of safety, the average rate is 0.935 cent per kilowatt-hour. The average fair lighting rate is, however, 1.77 and the average fair power rate is 0.639 cent.

It is seen, therefore, that the lighting rate is nearly double the average, and the power rate about one third less than the average rate. It is fallacious, therefore, to apply the average rate for a system to the different classes of consumers, or to different districts or towns. Each class, town or district gets the advantage of the diversity factor (usually about 1.3) for the system, but the rates for the class, town or district should be determined by the method here used. (See Fig. 2 for calculations.)

It is believed business will develop most naturally if energy and demand charges are divided as nearly as possible in re-

sponse to natural normal costs, and that the business of the various classes will develop most naturally if each class is made to bear its fair share of costs, having due regard for the fact that as a matter of policy it should be remembered that the low class power business promotes industrial and agricultural activity and tends to build up a stable and prosperous community.

Energy charges should only include those items that increase the cost to the company as kilowatt-hours are increased. Clearly for a water-power plant depending on the natural flow of the stream, all charges are fixed and are demand charges. For a steam plant energy charges are those charges that go to purchase fuel



Note that for an average rate for all classes of 0.75 cents at substation the equitable rates are as follows: Class 1, 2.05 cents; classes 2 and 3, 1.075 cents; class 4, 0.75 cents; classes 5 and 6, 0.425 cents.

and water for the steam plant. For a water-power plant with steam reserve, or its equivalent storage water, the cost of the fuel for the steam reserve plant and the cost of the storage water are energy charges.

items to be charged to energy are so simple that there can be no controversy as to what should be charged to energy and what should be charged to demand in any given case. That this is true can be easily seen by assuming any one class of consumers discontinued; also by the fact that investment, maintenance, etc., are proportional to demand of consumers.

In California, where we store water for three to four months, the energy charges will be between 0.1 and 0.15 cents per kilowatt-hour, as shown above. Calculations made in Figs. 2 and 3 show it is not equitable to distribute power at the substation to the different classes at the same cost per kilowatt-hour; in fact, it can be clearly shown that discrimination will result from such a practice to the

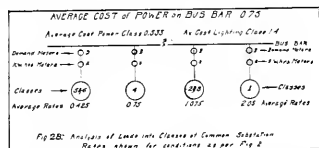
detriment of the power business, with the result that the entire business will suffer and the lighting rates must increase because the power business will not develop.

Having determined the amount of the energy charge E and having the total amount T to be earned by the system to the substations, the demand charge is $D = T - E$. This demand charge D is then proportionately charged to the several classes as shown on Fig. 2. This gives $t = d + e$ (total charge to any class equals sum of demand and energy charge of class) for any given class up to the substation.

To determine total cost to consumers for any given class we must know the cost of service for each class from the substation to consumers.

This would require that separate accounts be kept by classes for the entire system. Records of demands and kilowatt-hours consumed by different classes would also have to be kept.

Fig. 3 brings out very clearly the relation of the relative



Energy charges will vary, therefore, from 0 for the water-power plant without storage cost to the fuel cost of the energy produced by a steam plant. The

Peak demand of four large classes equal

Total yearly charge \$450,000.00

Energy charge varies from 0 to 0.75¢ per KWH hour

Class	KWH hrs at Sub
1	5 mil.
2 & 3	10 mil.
4	15 mil.
5 & 6	30 mil.

Equation of straight lines—

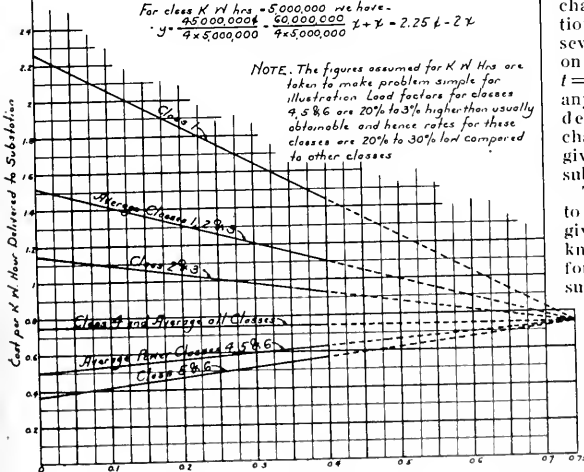
y = total rate, x = energy charge in cents per KWH hr

$y = \frac{450,000,000 + 60,000,000x}{4 \times \text{Class KWH hours}}$

For class KWH hrs = 5,000,000, we have—

$y = \frac{450,000,000 + 60,000,000x}{4 \times 5,000,000}$ $x + y = 2.25¢ - 2x$

NOTE: The figures assumed for KWH hrs are taken to make problem simple for illustration. Load factors for classes 4, 5 & 6 are 20% to 30% higher than usually obtainable and hence rates for these classes are 20% to 30% low compared to other classes



Energy charge per kilowatt-hour. Class rates at substations as varied by energy charge.

cost of power at substation for various classes of consumers for varying energy charge.

If there is no encouragement to develop water power the energy charges must be taken under steam plant conditions; that is, at about 0.3 to 0.5 cent per kilowatt-hour. If relative rates are taken under water power conditions than encouragement must be given to develop hydroelectric as against steam power. If we offer 8 per cent to the company that develops steam power we should offer more than 8 per cent to the company that develops water power. Otherwise it is plainly evident that there will be little water power development. The largest rate of return should be for investments in storage water, as the public obtains, in addition to the general benefits from the water power development, large indirect benefits from storage water, due to the fact that the stored water becomes available for irrigation, and increases the low water flow of navigable streams.

As a check on the above average lighting cost of power, let us see what the average cost of power for the residence lighting would be supplied by a steam plant. The residence lighting may be taken to extend four hours per day, and the following figures, then, are taken from Fig. 1:

Peak load steam plant,	2,000 kw.	
Average load steam plant, 4 hours	1,320 "	
Average load steam plant, 24 hours	220 "	
Kw-hr. per year,	220 × 8760 = 1,927,200	
Cost of plant	\$200,000.00	
Interest	8 per cent	
Maintenance and depreciation	4.5 "	
Operation and management, etc.	2.5 "	
Total cost	15 per cent = \$30,000.00	
Energy cost for fuel and water only, 0.5 cent per kw-hr. = 1,927,200 × 0.005 =		9,636.00
Total cost per year	3,963,600 cents	\$39,636.00
Cost per kw-hr. = $\frac{3,963,600 \text{ cents}}{1,927,200 \text{ kw-hr.}}$ =		2.05 cents
Demand cost		1.55 cent
Energy cost		0.50 cent
		2.05 cents

No load losses will increase this amount. We have also assumed only 2,000 kilowatts installed for a 2,000-kilowatt peak; to assure service some reserve capacity must be provided and this will, of course, increase the cost of service.

The cost of supplying power, therefore, to the residence lighting, will probably be over two cents per kilowatt-hour. A sliding scale would take care of differences in the individual lighting rate.

The steam plant capacity to take care of the four-hour peak is 2,000 kilowatts, or 20 per cent of the entire plant. The kilowatt-hours output is, however, only 3.2 per cent of the total output and only 12.8 per cent of the total lighting load. This brings out clearly the reason for the high unit cost for the consumer taking only a small amount of energy for lighting for about four hours per day.

It is generally known that the railroads prefer the freight to the passenger business, but it is not so generally known that the power companies, at least those having water power, prefer power business to lighting business. And again, commercial business is generally more attractive than residence business. This is evidenced by the fact that certain companies confine their operations to the commercial districts. One of the reasons for this condition is the large amount of capital necessary to serve the small consumer.

Thus it is seen that the attractiveness of the business really varies almost inversely as the rate per kilowatt-hour charged, which is directly contrary to public opinion.

In practice, the difficulty of determining average equitable class rates need not be serious. The most important item is the amount of power consumed by each class, and this can be determined; the item of the maximum demand of each class or the proportionate cost to be charged to each class of business cannot be so accurately determined, but if an error of 10 per cent were made in the example of power and light cost to substations, it would, say, increase the power rates from 0.75 to 0.825 cent, and reduce the lighting rates from 6 to 5.7 cents. An error of 10 per cent in the annual cost of operation would mean an error of \$22,000 added to one class and subtracted from the other. The total amount of revenue to be earned can readily be determined, and, if we get the class rates within 10 per cent of the correct amount, there should be no serious complaint.

It is a cut-and-dry method, but past practice has already largely determined class rates. The main thing is to have class rates that will develop the business and that will give consumers the right idea of the cost of their class of business, and not have the lighting consumer confused by having his mind on the power rate for an entirely different class of business and supposing that this rate should apply to him.

(To be concluded in our next issue.)

All Buildings Should Be Piped for Gas

“**T**RIUMPHANTLY complete.” That’s the way a recent English visitor to New York describes the Woolworth building in the London Daily Mail.

This is the tallest office building in the world, rising to a height of seven hundred and eighty-four feet above the sidewalk, and includes forty acres of floor space. No detail has been omitted to make this structure a complete modern business building, and it is *piped for gas throughout*.

No building can be considered modern without means to use gas for heating, refrigeration, power, waste disposal, water-heating and the equipment of kitchens for the feeding of the employees or for public restaurants. Gas burning appliances are available for all these uses and provision for them should be made by piping the building throughout on erection. If this is overlooked or omitted it will seriously interfere with the rental of modern buildings and result in a loss of revenue to the owners. The day is coming when buildings that are not piped for gas cannot be rented, and all architects should include a complete piping system for gas in their plans of all buildings, public or private. The Bureau of Engraving and Printing in Pekin, China, is piped throughout for gas, and the reasons which prompted this provision apply to every government and public building in the United States.



The Woolworth Building, New York City.

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VOL. VI. FEBRUARY, 1915. No. 9

EDITORIAL

All aboard for the Exposition!

California's day of opportunity, so long looked forward to, has arrived. The world now looks to our Golden State to make the most of that opportunity. Moreover, the world at large believes that she will.

As this issue of PACIFIC SERVICE MAGAZINE is presented to its readers the gates of the Panama-Pacific International Exposition are swinging wide in obedience to the announcement, "California invites the world."

The promise made by President Moore that the Exposition would open on schedule time has been kept. While not completed to the minutest detail, perhaps, our big Golden West show has reached the point where we may confidently invite the world's opinion upon it and as confidently abide the result.

It would be a commonplace to say that this has proved no small undertaking to carry to completion. And yet we question whether even the people of our own State realize what difficulties have had to be overcome, what obstacles surmounted, since that day in April, 1910, when a wildly enthusiastic throng of good citizens of San Francisco gathered in the hall of the Merchants Exchange and in less than two hours voted nearly five millions of dollars as a starter for the

great enterprise that was to be. It was not all plain sailing for President Moore and his associates from that time on, but like the stalwarts they were they stood shoulder to shoulder and fought the good fight in solid column. From start to finish there has been no cessation in the work since the first spadeful of earth was turned by President Taft in October, 1911.

The campaign of exploitation and education that was prosecuted during the construction period had its result in generous response from nearly every nation and state in the world. What for a moment looked like a serious if not a definite setback occurred when the goal was almost in sight, when, without warning, like a bolt from a clear sky, there sprang up an awful conflagration that took in the greater part of Europe and plunged countries that represented all that was noblest and best in civilization and culture into a strife whose end no man can see. But there was never any question that the Panama-Pacific International Exposition would be carried to completion, war or no war. The question was asked, of course. Inquiries came from the East and abroad. But the Exposition directors were ready with their answer: "The Exposition will proceed and will open on schedule time, February 20, 1915."

The people of the State of California may well congratulate President Moore and his associates upon their achievement. The Exposition that is now open to the public is in every respect worthy of the occasion that prompted it, the desire upon the part of the United States to hold a world's celebration in honor of the world's greatest engineering feat. That it will be a gigantic success, artistically, financially and in every other way, we feel assured even at this early date.

It promises to prove more than a mere exposition success. Men will travel from far ends of the earth to the city by the Golden Gate to see the glories spread before them, and having traveled thus far

will not rest content to turn upon their heels when they have seen their fill and return whence they came without wandering a step farther afield. The wonders of California's mountains and valleys invite inspection. There is room and to spare for the intending settler. Our State is not yet overcrowded. What is more natural, then, than to expect that a great percentage of our visitors will come to stay, will scatter over our State and take up their homes and ply their several vocations here, there and everywhere? For some time now California has been alive to the situation, and her children have been putting forth the best that lay in them. The field of investment has been enlarging day by day, and the great work of developing the natural resources of our wonderful State has progressed with giant strides. California, like a good housewife, has been putting things in order for the coming flood of welcome guests. They will not find her unprepared to receive them.

"Pacific Service" has played its part in the general scheme of preparation. Our readers do not need to be told what extensions and improvements have been made in our system, both gas and electric, in the past few years. Nor do our readers need to be informed that "Pacific Service" has supplied all the gas, electricity and steam that the Exposition has used for whatever purpose during its construction period and will furnish the entire supply during the life of the Exposition itself and on till the last trace of its existence has been removed from the grounds when all is over. Our company has spared no pains to insure the best possible up-to-date service. Our investment in extensions and equipment, in donations of both money and land, in loan of appliances and material, etc., is very large.

Last month our readers were treated to a description of the work done by our Gas Department in connecting up the Exposition grounds, and this month we

have an article upon the electric substation especially and solely constructed by "Pacific Service" for Exposition use.

TRANSCONTINENTAL TELEPHONE ESTABLISHED.

The inauguration of telephone service between the Pacific and Atlantic coasts on January 25th was an event of unusual importance.

Since the days of '49 the barriers separating California from the Eastern states have been gradually removed. The railroads, the telegraph and the Panama Canal have contributed their share to the rapid exchange of freight, passengers and ideas between the two sides of the continent. The opening of the telephone line is the crowning achievement. We all appreciate the value of the telephone in making possible instant personal communication. The benefits which are so evident locally from this service have now been extended to practically the entire country.

The wonderful development of the telephone in the short period since its invention was most strikingly demonstrated on the opening day when Dr. Alexander Graham Bell, the inventor of the telephone, talked from New York to Mr. Thomas A. Watson in San Francisco, 3,400 miles away. During this conversation exact duplicates of the original telephone instruments built by Mr. Watson for Dr. Bell were connected to the line and used by these men. Seldom does any man live to see such a marvelous development of his ideas as has Dr. Bell.

CHRISTMAS WINDOW DISPLAYS.

Of the Christmas window displays that we were able to observe, those of the Napa, Chico, Santa Rosa, San Rafael and San Mateo offices deserve particular mention. The design of each was originated by the men of the districts and it is fitting to mention that the "gas men" played the most prominent part in developing the different features shown.

The Californian's Return

By FREDERICK S. MYRTLE

*I sat in idle thought one day, when all the world seemed blue,
Turned upside down and inside out and rotten through and through;
The sun was shining brightly but, as it seemed to me,
My life was one of dead, dull and drear monotony.*

*There was nothing I could pick upon by way of finding fault;
No speck of cloud appeared to mar the blue of Heaven's vault;
We'd had no rain for seven months, the winds had failed to blow,
I'd tried to rake up trouble but the fates gave me no show.*

*Yet still I wasn't satisfied. 'Twas a case of too much joy;
Life was too lame, too easy, soft, like gold without alloy;
If only storm, nay tempest, had descended on the scene
There would have been a gorgeous chance to rid me of my spleen.*

*And when I picked the paper up and read of deeds of blood,
Of how an Eastern city had been wiped out by a flood;
Of riots in another, and panics here and there,
I got so mad I really think I started in to swear.*

*"What am I doing here?" I asked myself. "I'll up and get
To where it's storming, dismal, dark, and dull and cold and wet;
Why should I laze my life away in an atmosphere of bliss
When I am born for hardships?" Gee whiz, I'm tired of this!*

*"Our politicians, poets, and our after-dinner bores
Have sung of our Sierras and unloaded stores and stores
Of highly-colored phrases in a rapturous endeavor
To tread worn paths in fashion both original and clever.*

*"They've raved of moons and stars and things a-peeping through the trees.
Oaks, sycamores and redwoods, all bending to the breeze
Of morn, or noon, or night, or day—whatever hour it chanced
To seem unto the vision of the orator enraptured.*

*"Our oranges make public speakers tear their very hair,
Though it doesn't make them weep to find them off the bill of fare;
And each has told of lemons, and handed one or two
To the frenzied throng before him as he pictured skies of blue*

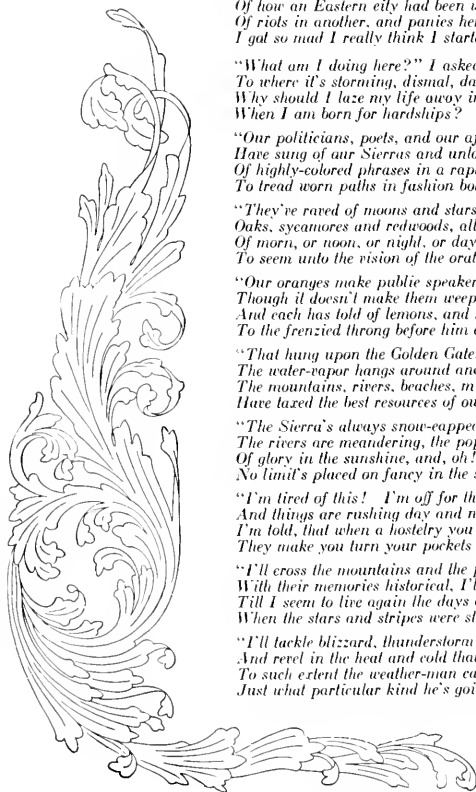
*"That hung upon the Golden Gate, where everybody knows
The water-vapor hangs around and the merry trade-wind blows.
The mountains, rivers, beaches, missions, poppies, mists and rains
Have taxed the best resources of our poets' fancy brains;*

*"The Sierra's always snow-capped; the beaches always laze;
The rivers are meandering, the poppies are a blaze
Of glory in the sunshine, and, oh! those missions old,
No limit's placed on fancy in the stories of them told.*

*"I'm tired of this! I'm off for the East, where the walled-in cities lie
And things are rushing day and night and living is so high,
I'm told, that when a hostelry you visit for awhile
They make you turn your pockets out, then tap you for your pile.*

*"I'll cross the mountains and the plains, and on rivers broad and swift,
With their memories historical, I'll let my fancy drift
Till I seem to live again the days of fifty years gone by
When the stars and stripes were steeped in blood and men made history.*

*"I'll tackle blizzard, thunderstorm and deluge, if I may,
And revel in the heat and cold that alternate, they say,
To such extent the weather-man can always keep you guessing
Just what particular kind he's going to send you with his blessing."*



*Well, away I went, and three long months I sojourned in the East;
I sampled all its glories and let my optics feast
On the sizzling, frizzling, churning, burning, brushing, rushing flow
Of hurrying humanity that made the passing show.*

*Whole heaps I found to admire. The Californian born
Need never sigh with ennui, nor find himself forlorn;
There's welcome and in plenty for all of him and more;
His name's alone a passport, he's shown courtesy galore.*

*New York in all its vastness has a charm for every kind
Of visitor who goes to see with appreciative mind;
And though no orange trees adorn its bustling thoroughfares
There's a quaint majestic grandeur comes upon him unawares*

*As he treads the paths of the kings of finance, of the gilded, cherished few
To whose nod the commercial pulse of the world responds. There's a
pleasure, too,
In watching the constant ebb and flow of the human stream each day
Hurrying hither, thither, earnest in work and in play.*

*But a city's a city the wide world o'er. There was far more charm to me
In the broad, deep, rolling rivers that swirled their way to the sea;
There was picturesque scenery everywhere, and all was vast and grand,
And I saw why a man has a lasting love for his own particular land.*

*We are not the only gems of the earth, we men of the Western coast.
And there are other beauties than those of ours of which daily our songsters
boast:
There's a deal in association, and the fickle heart may be weaned
Away from a first fond love, a truth that many of you have gleaned.*

*So when my trip was ended and the bell had rung for home,
I was just a trifle sorry that I hadn't had time to roam
A wee bit further inward, where New England meadows green
Remind one of the mother land and old ocean spread between.*

*A thought of this and of many things in the quiet of the train,
And I wondered how it all would look when I reached home again:
And whether pastoral scenes and endless sunshine would appeal
To my new-awakened senses that had just begun to feel*

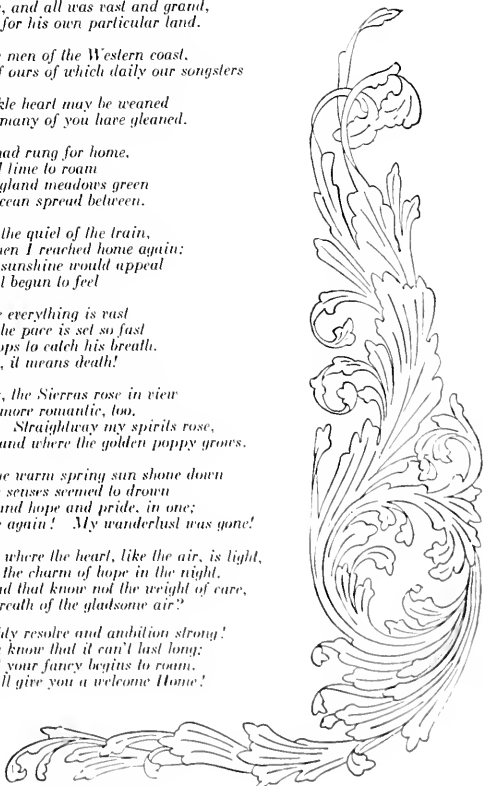
*The call of the busy, bustling East, where everything is vast
And swift and quite uncertain, too, and the pace is set so fast
That woe betide the luckless wight who stops to catch his breath,
It sure means loss of fortune; if repealed, it means death!*

*But the train sped on; and then, one day, the Sierras rose in view
And I saw them a trifle nobler, grander, more romantic, too,
Than aught I had seen on the other side. Straightway my spirits rose,
And I knew once more the charm of the land where the golden poppy grows.*

*The train rolled down to the valley and the warm spring sun shone down
On a vista of farm and vineyard, that my senses seemed to drown
In a flood of joy and peace and comfort and hope and pride, in one;
My question was answered. I was home again! My wanderlust was gone!*

*Oh! is there a land like the Golden West, where the heart, like the air, is light,
Where the joy of living is in the day and the charm of hope in the night,
Where toil rests light upon shoulders broad that know not the weight of care,
And pleasure's wand bends guiltily to the breath of the gladsome air?*

*We'll give you the East, you men of mighty resolve and ambition strong!
You can have your hour of glory, but you know that it can't last long;
So, when you are tired, brain-weary, and your fancy begins to roam,
Come to the West, to our open arms—we'll give you a welcome Home!*



Tidings From Territorial Districts

Alameda County District

Over in the Oakland organization, there is a branch called the Commercial Department. This department is made up of about a dozen men who make a study of human nature. These men go out in the highways and byways suggesting the further use of gas and electricity. You would think that a person himself would know whether or not he wanted gas or electricity without some outsider coming along and butting in. No, business would be mighty dull if the company hung out a sign, "This is the Gas and Electric Office" and waited for business to come in. So there is a department that actually makes business, creates it—by the power of suggestion. In this Oakland department there are interesting men; boys, they call them. Every morning at 8.15 they gather around a table and there the work of yesterday is discussed and the work for the ensuing day planned out. It is remarkable fellowship. Each tells of his experiences and helpful suggestions are made for broader and better work. One of the boys is Cornell—Burdette Cornell. Cornell is well named, for he is an institution of learning. When our country was in a political storm and about to be wrecked on the many-jagged silver question of 16 to 1, it was no other than this same Cornell who stumped this state for William Jennings Bryan. That is past history but Burdette has retained the silver standard in oratory—a silver tongued orator—and keen cut in expressing himself as 16 to 1. Of course, Bryan was not elected; that was no fault of Cornell's. Cornell, however, modified that defeat by a large plurality. None of us ever did understand that silver issue nor do we to this day, yet Cornell explains it very satisfactorily—he gets the last word.

We said these commercial men were students of human nature and got business by butting in. Burdette is modest, so, if you will be confidential, here are the nature stories, and how he learned the art of butting in. Once upon a time, some few years ago, double happiness came to the Cornell home; twins. At that time, the much advertised certified milk made its advent. So the certified, only, was ordered. But before long a scandal broke out in print. Certified was no other than a bottle with a label at a higher price. Cornell's indignation also became plural. He set about to solve the purity

problem—bought a goat. The nature studies now begin. The goat is a very docile animal if you milk it the right way. The goat and the milk make a splendid butter; questions of specific gravity—displacement. The goat seeks high places. The foot is cleft; Gee-Left! The goat teaches you to hustle; got the cue? Burdette did. Incidentally, the goat is strong on "single tax"; so is Cornell. Never ride a goat unless you are sure of the lodge; you may not lodge on green velvet. Don't attempt to lead a goat; unless it be willing. It works well with a pull, but best be driven in a quiet, persuasive way. In transacting business with a goat, first be sure where you stand. The goat eats Carnation Cream cans to flavor its milk; you can argue the relation of things when there is a doubt.

The moral all resolves itself to one word, "Go-at-iveness." So Cornell presented the toy goat to the Commercial Department as a fit mascot. But one day the goat disappeared; it was deliberately taken.

For once, they got Cornell's goat.

A recent power installation in the Alameda County District is that of the Barbour Chemical Company (formerly the Leona Chemical Co.) located at Fiftieth avenue and the Southern Pacific Railroad tracks.

The Leona Chemical Company has been operating for a number of years with a small installation of 50 H.P., but since the change to Barbour Chemical Company the plant has been enlarged and they are preparing to do a large business in their line. In fact, they are already figuring on doubling the plant just installed. "Pacific Service" must be satisfactory, as they are coming back for more.

The new installation consists of 425 H.P. in three-phase 2300-volt induction motors, one of which is 300 H.P., and drives the main part of the machinery. Other motors are three-phase 220-volt and their aggregate capacity is 150 H.P. These are used for pumps, blowers, a small crusher, and other small drives.

Current is taken from a 4 K.V. distribution circuit through a three-conductor 11 K.V. cable to the transformer house, then through an automatic oil switch, and to two separate 4 K.V. busses. One bus supplies three 30 K.W. transformers which supply the 220-volt motors, and the other three 100 K.W. transformers

connected as compensators to give the three-phase 2300 volts.

F. A. LEACH, JR.

Marysville District

Yuba County is to see a great agricultural development this year among the many land subdivisions, as the people of the south are just learning the rich qualities of superior California.

The directors of the Yuba Land Company recently visited their property ten miles north of Marysville and completed plans for the development of their large holdings.

They are now ready to populate the Mission colony and anticipate that fully \$200,000 will be expended in Mission this coming year, while within the next five years the development figures will amount to about \$300,000. They have already made a contract with Dutard & Co. to plow six thousand acres, and have on the ground two of the largest type Rumley tractors with complete equipment of plows and other implements, and within a week or so two large caterpillars will be added to this outfit. There has been a little delay in the plowing on account of the wet weather, and in taking the tractors to the land a bridge was broken down and much difficulty was encountered in transporting this heavy machinery over the roads. Up to date 660 acres are already contracted to be put into olives, and other contracts are being made. These people are receiving a large number of inquiries from settlers throughout the country, and from now on will be busily engaged in getting them located on their land. Some of them have already arrived and are shipping in their equipment from other places.

About 13,000 acres will be developed in this section. There is an abundance of water close to the surface, also cheap electric power which, with unusually good railroad facilities, will make this land very valuable.

With the rainfall of the season about normal, farmers and ranchers throughout the country are planting and setting out trees for the present season. The work was begun actively this month and for the next few weeks will be under way at full speed.

The rain hampered the planting, several plowing outfits which had been hired to turn over the soil on the larger ranches of the county being compelled to stop work. It will be resumed if the weather clears, or if it does not rain too hard.

Larger acreages of every known product of the soil which can be grown in Sutter County will be planted this season. Fruit orchards in particular will be greatly increased in acreage. This is also

true of all agricultural products to be planted.

Although the crop output in almost every product raised in the county touched a new record this year, an attempt will be made to increase it during the coming season. With this end in view, every loyal farmer and rancher is planning to co-operate in bringing about a record 1915 crop.

All the preliminary work on the route of the state highway from Yuba City to Live Oak has been completed in the way of surveys and mapping, etc., and the actual construction of the road will commence in the early part of the year. The contractors, Charles and A. W. Correll of San Francisco, are in consultation with the State Highway Commission and are preparing for the actual construction work. As there are only a few minor culverts to be built and the right of way has been obtained the county will not have much to pay out for construction direct.

J. M. Perdee of Odessa, Missouri, has purchased 889 acres of fertile land near Tudor from C. G. Grant, with a view of colonizing the tract. He will subdivide it into small farms. It is said the sum involved was \$89,000. Electric power will be wanted in this section.

California being adjudged first in gold production in the United States means that Yuba County is the greatest gold producing county in the country, as this county is credited with being the largest producer of gold in this state. Not only is the county now the greatest producing section in the United States but is destined to remain as such, as new gold fields are being opened every year. Shortly, with the activity of the Guggenheim interests on the Yuba river, the production will be greatly increased, it is believed.

There is also a chance of a large rice mill being established in Live Oak this year which will need a large amount of power from "Pacific Service." Prospects look most favorable in all towns in this district for a record-breaking year, and which will add greatly to the prosperity of the State.

J. E. POINDESTER.

Fresno District

The cooking school just held last week at the new White Theater has been an exceptional success, the best that has ever been put on in this district, and the best that it has ever been my experience to witness. The new White Theater was packed daily to its full capacity. The women generally took great interest, and after the sessions both Mrs. Vaughn, demonstrator, and Mrs. Boyd, of "Pacific Service," were busy for over an hour answering questions on matters that had

come up during the day or on matters referring to the usages of gas. Three prizes were given away, one of which was a Domestic range, the contest being on the best cake, the best pie and the best doughnuts baked. After the prizes had been awarded, all the pies, cakes and doughnuts were turned over to the Citizens' Relief Committee to be delivered to the poor.

Business is picking up rapidly in Fresno. Bank clearings for December were quite a percentage higher than the year before.

Building permits for January, 1915, were approximately twenty per cent higher than January, 1914.

The merchants generally report that business is constantly improving. We are above the normal average of rainfall at this time.

Mr. H. C. Ross is now in charge of the new business department, coming to us from the Southern California Gas Company. He has had a general experience through Baltimore and Washington.

M. L. NEELY.

Napa District

For the past three years the Napa District employees have, about the time duck shooting is good, invited themselves to an annual dinner. The last gathering of the kind was held on November 14th, and while it did not hold to the precedent of being a duck dinner there was no comment on the absence of the duck once the turkey was served.

The affair was strictly a "Company Dinner." From the decorating of the store room with greens and miniature colored electric lights to be in keeping with the dainty arrangement of the festive board, with its many subdued lights throwing their soft glow on sparkling glass and shining silver, to the basting of the savory turkeys and the dexterous appearance and disappearance of the many courses, even to the prosaic washing of the dishes, the work was all done by "Pacific Service." Oliver Michelson's reputation as a chef par excellence is as firmly established in Napa District as Charles McKenzie's reputation as an artist in arranging the decorations.

Unfortunately the date selected for this dinner clashed with that of the U. C. Stanford "big game," and Napa District men were disappointed in receiving regrets in reply to many of the invitations sent to department heads in the city office. Among those who sat down with the local men were Mr. O. E. Clark, retired manager Napa District; Mr. Driscoll, representing the Auditing Department; Mr. Earl Fisher, representing the Commercial Department; Mr. C. E. Young, rep-

resenting the Operation and Maintenance Department; Mr. Smith, representing the Land Department; Mr. Pierson, representing the Sales Department, and Mr. Fred George, load dispatcher.

District Manager Clarence D. Clark opened the after dinner part of the evening with the idea of getting each one present on his feet before the evening was over to say something about the particular work he is doing to make "Pacific Service" "Perfect Service," and he more than accomplished his object. Much information was passed out and enthusiasm stirred up beside a goodly share of mirth and jollity. When the evening was over the thirty-two present were unanimous in their opinion that it was a most helpful and enjoyable affair and worthy of its name.

The gas maker of Napa District challenges any one on the system to duplicate his record. Here it is:

On December 30th last when he started to make gas in the morning he found that the primary of his "large" generator would not heat up, try as he would to get it hot. He limped through the day making most of the gas in the secondary, and when his holders were full he opened up the primary only to find that the checker work was "all in."

Preparations were made to rechecker immediately and so the following day the small Lowe set which had not been in service for several years was started up with fear and trembling lest it would not be able to keep up to the demand from the town. Our peak demand is 8000 cubic feet per hour, and the average continuous demand is 3500 and the rating of the Lowe generating set is 4000, so that with our daily output of 8000 cubic feet the gas maker would be rated at twenty hours per day.

Due to delays in getting material it was six days before the regular generator was rechecked and in service again but the holders were at no time near the ground and the gas maker still had time to help rechecker the other machine so as to have it just as he wanted it.

Mr. Herman Pfluger wants to know who can beat his record. C. D. CLARK.

San Jose District

One of the oldest landmarks in Los Gatos and vicinity, the Old Stone mill, is being torn down, as it is now considered unsafe. The big quake of 1906 shattered it to a considerable extent, and the shake of a few weeks ago left it so badly damaged that it was deemed unwise to leave it standing longer, so the work of taking it down was commenced last Thursday morning. It will be taken down to the first story.

The early history of this well-known building is told in "Pen Pictures from the Garden of the World," or "Santa Clara County," a handsomely illustrated volume of 672 pages, published in 1888, from which we quote:

"The first building in this now thriving town was Forbes' mill, and for many years the place was known by that name. This enterprise was begun by James Alex. Forbes in 1850, but it was not completed until four years afterward. It was an old-fashioned structure with overshot wheels twenty feet in diameter, which, owing to the lack of power, the water-head being only twenty feet, was not successful in its operations. It passed from Forbes to a French firm, V. Marzion & Co., who also made a failure. A. Pfister & Co., of San Jose, then leased the property, but found it unprofitable. It then passed into the hands of Samuel & Fanner, who raised the water, by means of a dam, to a height of thirty feet. In 1866 W. H. Rogers & Co. purchased the property, raised the head to sixty feet, and substituted the turbine wheel for the old overshot. In 1870 the head was raised to two hundred feet. This gave abundance of power to all the machinery. At this time the company was made a joint stock concern, W. H. Rogers, J. Y. McMillan, W. H. Rector, W. S. McMurtry and C. C. Hayward being the incorporators.

"It was known as the Los Gatos Manufacturing Company. A four-set woolen mill, two stories high, was erected and operated successfully until 1872, when it burned down and was not rebuilt. The flouring mill continued operations, changing its system in 1883 from stones to improved rollers, and turning out a product that became noted throughout the coast for its uniform excellence. In 1886 the Central Milling Company of San Jose was formed. The Los Gatos mills went into the combination and were closed.

"Up to 1859 there were no houses in Los Gatos except the mill and a few cabins occupied by the workmen. In 1862 Mr. Samuels built a house, which has since been occupied by W. S. McMurtry as a residence. McMurtry & McMillan started a store and lumber yard in 1863. This store afterwards came into the hands of the Los Gatos Manufacturing Company."

Concerning the old mill itself that is practically all there is to tell. In after years it was used for storage of hay, etc., and on the first floor are now located the great transformers of the Pacific Gas and Electric Company, which a couple of years ago took over the Los Gatos Ice, Gas and Electric holdings in Los Gatos. *Los Gatos Mail.*

Sacramento District

One of Manager McKillip's motormen is a natural wit. A few weeks ago an easterner got on his car at the Southern Pacific station for a ride up K street. He asked the motorman all sorts of questions about the great West and the opportunities for investments here.

Presently, so the story runs, they reached Thirteenth and K streets. On the left hand corner is a big Chinese laundry run by one "Hop Lee," whose sign stands out boldly in the sunlight. "A Chinese wash house, typical of our California life," said the motorman, pointing.

"But here I see another sign—Don Lee," said the easterner, pointing to the opposite corner, where Don Lee's big Cadillac agency has Sacramento headquarters. "Yes," replied the motorman. "Hop's blood brother, worth a couple of million. Pacific Coast agent for the Cadillac; simply shows what energy and brains can do in this country!"

"You astound me!" ejaculated the easterner, but not a passenger spoiled the joke.

San Francisco District

The Sales Department announces the closing of a contract covering the supplying of electric energy to the W. P. Fuller & Company's plant in South San Francisco, for the operation of 650 H. P. in motors.

The securing of this business will result in the closing down of the steam generating plant of the paint company, and another of the large industrial plants in California will rely upon "Pacific Service" for its power supply.

Mr. L. F. Galbraith was given credit by the Sales Department for closing this contract.

Our "Pacific Service" patrons and readers will be pleased to learn that probably in a year from now more congenial quarters will be provided for our James Hugh Wise library in the new office building annex on Sutter street.

The San Joaquin Light and Power Co. has kindly donated a copy each month of its magazine to our files.

Mrs. Clara B. Wise has given four additional bound books covering miscellaneous subjects.

Mr. Britton's office has presented a number of the Proceedings of the California Academy of Sciences.

The number of bound books on hand to date is 779, and the pamphlets 2799.

Activities of "Pacific Service" Tennis Club

By E. B. HENLEY

SINCE the dedication by Mr. Britton, on last Thanksgiving morning, of the courts of the "Pacific Service" Tennis Club adjoining the Company's office building at 445 Sutter street, enthusiasm seems to be growing among the employees of the company regardless of the inclement weather. If the present interest continues, when nice weather eventually comes these courts will in all probability be two of the busiest courts in San Francisco.

On Saturday afternoon, the 23rd of January, there were five double matches—best two out of three—played by the teams composing the Round Robin Tournament of the "Pacific Service" Tennis Club, with the following results:

Frickstad and Carpenter beat Dangers and Dougherty	6-1, 6-2
Henley and Delaney beat Dangers and Dougherty	6-1, 6-2
Dazey and Miles beat Dangers and Dougherty	6-3, 6-1
Dazey and Miles beat Uibigan and Van Zandt	6-2, 7-5
Vensano and Dodge beat Ohnemuller and Bucher	6-0, 6-1

The ranking to date is as follows:

1. Henley and Delaney.
2. Frickstad and Carpenter.
3. Dazey and Miles.
4. Dangers and Dougherty.
5. Uibigan and Van Zandt.
6. Trowbridge and McDougall.
7. Monroe and Steele.
8. Fisher and Downing.
9. Vensano and Dodge.
10. Ohnemuller and Bucher.
11. Rogers and Szczepanski.

At an election held by the Club, the following members were chosen to act as Board of Directors:

- R. E. Fisher, chairman.
- W. G. Vincent, tournament.
- E. B. Henley, secretary and treasurer.
- H. C. Vensano, business manager.
- E. E. Dodge, captain of courts and assistant secretary and treasurer.

The board has under advisement at the present time the following improvements which will make the courts more com-

fortable: Shower baths, ladies' dressing room, removal of additional braces and posts supporting billboards which are now constructed too near the court lines, general cleaning up and repainting of the lines.

Mr. Vincent reports that he is endeavoring to make arrangements for the holding of the open singles tournament earlier this year than usual, in order, if possible, to have an open doubles tournament follow later in the season.

The membership, however, is not keeping up with the enthusiasm as indicated by the playing on nice days, and the club is endeavoring at the present time to interest more of the employees of the Pacific Gas and Electric Company. Along this line it has recently received applications from twelve of the ladies of the company. If any members of "Pacific Service" who have not already joined desire to do so or wish further information regarding it, they are requested to write directly to any one of the directors, who will furnish promptly full particulars and information.

Possibilities

(Suggested by the recent weather conditions)

Believe me, boys, it's sure some sport
To gambol on a tennis court;
To chase the bouncing tennis ball
Around a ruined cellar hall.
But times have changed, and weather too,
The tennis courts submerged from view
Afford amusement, otherwise
The tennis fans must compromise.
Let's stock the pool with mountain trout
Or have a water polo bout;
And, really, I don't see why we can't
Install an hydro-electric plant.

H. B. P.

DOINGS*of* **“PACIFIC
SERVICE” SECTION****N.E.L.A.****CHRONICLED BY ERNEST B. PRICE**

For the first time in the history of the local section, a joint meeting was held between the “Pacific Service” section of the National Electric Light Association and the San Francisco section of the American Institute of Electrical Engineers. This amalgamation was due to the fact that a paper of unusual interest was to be read before the Institute entitled “Best Control of Public Utilities,” by Mr. Frank G. Baum. As the meeting of the “Pacific Service” section of the N. E. L. A. was equally important, being distinguished by the presence of Mr. T. Commerford Marlin, secretary of the parent body, and Mr. G. W. Elliott, master of transportation, it was arranged by the committees to combine the two meetings, as many members of the N. E. L. A. are also identified with the American Institute of Electrical Engineers.

Mr. S. V. Walton, as chairman of the “Pacific Service” section, extended a cordial welcome to the members of the American Institute of Electrical Engineers and to the members of the General Convention Committee of the National Electric Light Association and stated that by a happy combination of circumstances it was possible to bring together so many representative men of the electrical profession. He then presented the first speaker of the evening, Mr. John A. Britton.

In his address to the meeting, Mr. Britton paid a glowing tribute to the splendid work which had been done in connection with every branch of the Panama-Pacific Exposition, and how the finished product stood forth to the world as a monument of efficiency and co-operation. Mr. Britton also touched upon the important part which “Pacific Service”

has and will play in the success of the undertaking. Continuing, Mr. Britton said:

“The work cut out for this section of the National Electric Light Association during the coming year is one that ought to be a pleasure, as it will be I am sure at the end a profit. We are particularly fortunate in having secured the presence here this year of the annual convention, which will be held in the month of June.

“There is perhaps no association—I will make no reservation—there is no association of men in the world that contains within its membership as many men of mark, of rank, of ability, as does the National Electric Light Association. It has bidden up from its very beginning the central stations of America. It has been first and foremost in its work of helping and guiding the companies associated with it. It has been a great force in guiding and forming the legislation of this country in so far as it might affect the central station industry.”

In referring to the American Institute of Electrical Engineers, Mr. Britton said: “It is with particular pleasure that I welcome the members of the American Institute of Electrical Engineers, which society has also accomplished much in creating interest in the work of our industry, and in bringing it up to its present standard of efficiency; and I am sure that the paper which will be read before you tonight cannot fail to impress you with what scientific thought can do toward molding public opinion and the opinion of those who have the power to enact the laws of this country.”

At the conclusion of this address, Mr. T. Commerford Martin was presented by Mr. Britton. He expressed great satisfac-

tion in observing the co-operation between the A. I. E. E. and the N. E. L. A., and called our attention to the wonderful growth of the central station industry, because of whose remarkable development in the past thirty years the requirements and qualifications of the profession had become more exacting on account of the complex and diversified problems which must now be solved by the electrical engineer of today.

Mr. Martin also spoke of the great educational work which was being done by the National Electric Light Association among the men of the central station industry and of its influence in developing energy, ability, enthusiasm and loyalty. The value of the human equation must not be underestimated, he said, and while diligently searching for inefficiencies in our apparatus and lines, we should look well within ourselves and constantly strive to meet the test of efficiency as disclosed by the searchlight of personal analysis.

Mr. Geo. W. Elliott, master of transportation for the N. E. L. A., was then presented by Mr. Britton, and gave an instructive description of the problem of transportation in connection with convention work, explaining in detail the routing and stopping points of the five special trains which will bear our eastern friends to the convention to be held in June. We were glad to know that the eastern members will have an opportunity of viewing Lake Spanlding dam, as well as other developments of our system.

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Get Busy, You Athletes, Get Busy!

TO ALL EMPLOYEES, PACIFIC GAS AND ELECTRIC COMPANY:

At a recent meeting of the executive committee of the "Pacific Service" Section of the National Electric Light Association it was decided, in view of popular demand, to make athletic events a feature of our Section in future, and with this end in view, the undersigned committee has been appointed for the purpose of interesting not only present members of the N. E. L. A., but other members of the Pacific Gas and Electric Company who may be interested in athletics.

The following have been suggested as being the most popular sports of the day:

*Baseball,
Handball,
Tennis,
Bowling,
Boxing,
Pool,
Swimming and Diving.*

Possibly other sports may be later taken in.

We would request the co-operation of managers and department heads in canvassing for the necessary talent.

It is our intention to establish from the ranks, without regard to position, baseball and bowling teams. What we now desire to do is to unearth the talent. We know there is a great deal of it among our employees and we do not want any of them to be backward about sending in their names, stating in what particular branch of athletics they are interested or are proficient. In the case of a baseball team, we are assured by the executive committee that if we can secure the necessary talent, it will provide uniforms and will pay the reasonable expenses of the successful contestants for the team.

We want to make this athletic feature a success, but in order to do so must have co-operation. Please get busy and send in the names of any of your employees, indicating which particular athletic branch they are interested in. All names should be sent in to the Athletic Committee, National Electric Light Association, San Francisco, in care of the Pacific Gas and Electric Company.

Yours very truly,

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P. M. DOWNING,
W. G. VINCENT,
R. E. FISHER,
K. I. DAZEY.

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CITIES AND TOWNS SUPPLIED WITH GAS, ELECTRICITY, WATER AND RAILWAY

SERVICE FURNISHED	NUMBER OF CITIES AND TOWNS SERVED BY COMPANY			TOTAL POPULATION
	DIRECTLY	INDIRECTLY	TOTAL	
Electricity.....	126	49	175	1,221,218
Gas.....	48	2	50	1,125,068
Water (Domestic).....	8	11	19	58,690
Railway.....	1	..	1	75,602

Place	Population	Place	Population	Place	Population
¹ Alameda.....	27,000	¹⁴ Gold Run.....	100	¹ Piedmont.....	1,720
¹ Albany.....	800	¹⁵ Grass Valley.....	4,500	¹ Pike City.....	200
¹ Amador City.....	200	¹⁶ Gridley.....	1,800	¹ Pine.....	1,500
¹ Allegany.....	200	¹⁷ Grimes.....	250	¹ Pittsburg.....	2,372
¹ Alviso.....	200	¹⁸ Groveland.....	125	¹ Pleasanton.....	2,000
¹ Angel Island.....	280	¹⁹ Guerneville.....	500	¹ Port Costa.....	600
¹ Atherton.....	250	²⁰ Hampton.....	500	¹ Redwood City.....	3,200
¹ Auburn.....	2,375	²¹ Hayward.....	4,000	¹ Richmond.....	10,000
¹ Agua Caliente.....	100	²² Hillsborough.....	1,000	¹ Rio Vista.....	884
¹ Alvarado.....	900	²³ Hollister.....	3,000	¹ Rocklin.....	1,000
¹ Antioch.....	3,000	²⁴ Ignacio.....	100	¹ Roseville.....	2,600
¹ Arboga.....	100	²⁵ Long.....	900	¹ Rodeo.....	500
¹ Barber.....	500	²⁶ Irvington.....	1,000	¹ Ross.....	500
¹ Belmont.....	350	²⁷ Jackson Gate.....	100	¹ Russell City.....	250
¹ Ben Lomond.....	800	²⁸ Jackson.....	2,035	¹ Sacramento.....	75,602
¹ Belvedere.....	1,000	²⁹ Jenkintown.....	250	¹ San Andreas.....	200
¹ Benicia.....	3,360	³⁰ Knights Landing.....	350	¹ San Anselmo.....	1,500
¹ Berkeley.....	53,000	³¹ Knightsen.....	125	¹ San Bruno.....	1,500
¹ Biggs.....	750	³² Lafayette.....	100	¹ San Carlos.....	100
¹ Bolinas.....	500	³³ Live Oak.....	200	¹ San Francisco.....	530,000
¹ Brighton.....	100	³⁴ Livermore.....	2,250	¹ San Jose.....	37,946
¹ Broderick.....	200	³⁵ Los Gatos.....	3,000	¹ San Leandro.....	4,000
¹ Burlingame.....	400	³⁶ Larkspur.....	600	¹ San Lorenzo.....	100
¹ Camp Meeker.....	200	³⁷ Lincoln.....	1,400	¹ San Mateo.....	6,500
¹ Campbell.....	600	³⁸ Lomita Park.....	100	¹ San Quentin.....	2,500
¹ Centerville.....	1,000	³⁹ Los Altos.....	500	¹ San Rafael.....	6,000
¹ Chico.....	13,000	⁴⁰ Loomis.....	400	¹ San Pablo.....	1,000
¹ Colinsville.....	150	⁴¹ Madison.....	250	¹ Santa Clara.....	6,000
¹ Colma.....	3,500	⁴² Madrone.....	125	¹ Santa Cruz.....	10,000
¹ Colusa.....	1,500	⁴³ Martinez.....	5,000	¹ Santa Rosa.....	10,500
¹ Concord.....	1,500	⁴⁴ Martell.....	150	¹ Sebastopol.....	1,200
¹ Cement.....	1,500	⁴⁵ Marysville.....	7,000	¹ Sausalito.....	2,500
¹ Celina.....	500	⁴⁶ Mayfield.....	1,500	¹ Sheridan.....	150
¹ Cordelia.....	150	⁴⁷ Menlo Park.....	1,500	¹ Smartsville.....	500
¹ Corte Madera.....	350	⁴⁸ Meridian.....	300	¹ South San Francisco.....	2,500
¹ Crockett.....	2,500	⁴⁹ Millbrae.....	300	¹ Stanford University.....	2,600
¹ Crow's Landing.....	375	⁵⁰ Milpitas.....	300	¹ Sonoma.....	1,200
¹ Daly City.....	250	⁵¹ Mill Valley.....	2,500	¹ Stege.....	1,000
¹ Danville.....	250	⁵² Mission San Jose.....	500	¹ Stockton.....	35,000
¹ Davis.....	750	⁵³ Mokelumne Hill.....	150	¹ Suisun.....	1,200
¹ Decoto.....	350	⁵⁴ Morgan Hill.....	500	¹ Sutter City.....	150
¹ Dixon.....	1,000	⁵⁵ Mountain View.....	2,500	¹ Sutter Creek.....	1,500
¹ Davenport.....	1,000	⁵⁶ Mt. Eden.....	200	¹ Sunnyvale.....	1,500
¹ Durham.....	500	⁵⁷ Mare Island.....	500	¹ Thurton.....	400
¹ Dutch Flat.....	500	⁵⁸ Marina.....	7,500	¹ Towle.....	100
¹ Duncan's Mills.....	150	⁵⁹ Nevada City.....	2,700	¹ Vacaville.....	1,200
¹ Edenvale.....	500	⁶⁰ Newark.....	700	¹ Vallejo.....	13,600
¹ Eldridge.....	500	⁶¹ Newcastle.....	750	¹ Vineburg.....	200
¹ Elmira.....	150	⁶² Newman.....	1,000	¹ Walnut Creek.....	350
¹ El Verano.....	400	⁶³ Niles.....	800	¹ Warm Springs.....	200
¹ Emeryville.....	5,000	⁶⁴ Novato.....	250	¹ Watsonville.....	4,500
¹ Encinal.....	100	⁶⁵ Oakland.....	215,000	¹ Wheatland.....	1,400
¹ Fairfax.....	500	⁶⁶ Occidental.....	400	¹ Winters.....	1,200
¹ Fairfield.....	834	⁶⁷ Orange Vale.....	100	¹ Woodland.....	5,500
¹ Forestville.....	100	⁶⁸ Palo Alto.....	6,300	¹ Woodside.....	200
¹ Felton.....	300	⁶⁹ Pacheco.....	200	¹ Yolo.....	400
¹ Fresno.....	40,000	⁷⁰ Penryn.....	250	¹ Yuba City.....	1,200
¹ Folsom.....	1,800	⁷¹ Patterson.....	300		
¹ Gilroy.....	2,000	⁷² Penn Grove.....	300		
¹ Glen Ellen.....	500	⁷³ Petaluma.....	5,500		

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30 of California's 58 counties.

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¹/₄ the size of New York State.

¹/₄ the size of all the New England States combined.

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When writing, please mention PACIFIC SERVICE MAGAZINE



PACIFIC SERVICE MAGAZINE



PALESTINE, THE LAND OF THE FUTURE

Vol.
6

MARCH • 1915

No.
10

Published Monthly by the Pacific Gas and Electric Co., San Francisco, Cal.

The Pacific Telephone and Telegraph Company

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Pacific Service Magazine

VOL. VI



No. 10

Yearly Subscription \$1.50

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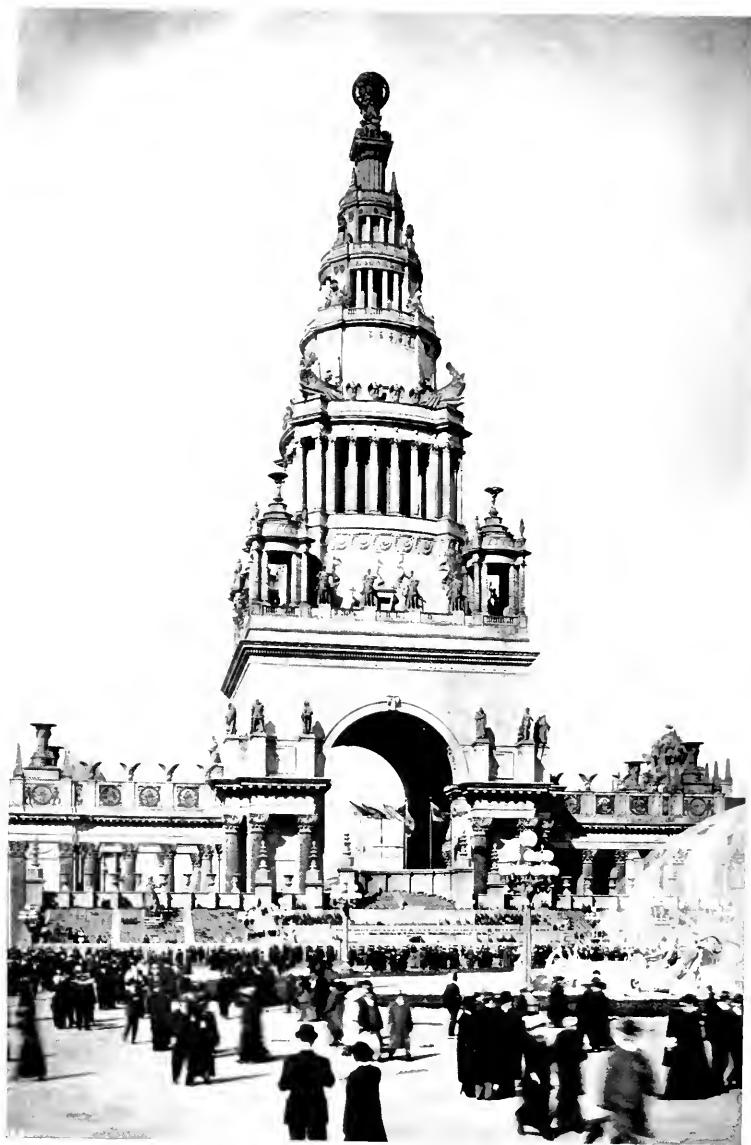
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Contents for March

IN THE CENTER OF THE EXPOSITION GROUNDS—	
THE TOWER OF JEWELS	<i>Frontispiece</i>
THE MOST BEAUTIFUL EXPOSITION IN HISTORY	<i>F. S. Myrtle . . . 327</i>
"PACIFIC SERVICE" vs. WINTER SNOWS—A TRYING EXPERIENCE	<i>Jas. F. Pollard . . 335</i>
FIGHTING FLOOD IN RECLAMATION DISTRICTS	<i>J. W. Coons . . . 339</i>
THE STORY OF ELECTRA—RECALLED TO MEMORY BY THE RECENT DESTRUCTION OF THE FAMOUS BOARDING-HOUSE	<i>Randall Ellis . . 340</i>
A WARNING TO MISCHIEVOUS BOYS	<i>346</i>
WHERE "PACIFIC SERVICE" CROSSES THE STRAIT OF CARQUINEZ—THE NEW SYSTEM OF CABLES AND TOWERS	<i>Geo. H. Bragg . . 347</i>
WHAT A 750-WATT NITROGEN LAMP WILL DO	<i>W. S. Cluff . . . 351</i>
EDITORIAL	<i>352</i>
THE BEST CONTROL OF PUBLIC UTILITIES (<i>Concluded</i>)	<i>F. G. Baum . . . 354</i>
"PACIFIC SERVICE" RECLAMATION WORK IN MARIN	<i>Carl A. Phelps . . 356</i>
"SAFETY FIRST"—A WARNING	<i>Central Safety Committee . . 358</i>
PACIFIC COAST GAS ASSOCIATION—NOTICES	<i>E. C. J. and H. B. . 359</i>
DOINGS OF "PACIFIC SERVICE" SECTION, N. E. L. A.	<i>E. B. Price . . . 360</i>

Index to Advertisers

Allis Chalmers Mfg. Co.	iii	Pierson, Roedling & Co	vi
Associated Oil Co.	iii	Roebling's, John A., Sons Co	vii
Bonbright, William P., & Co.	i	Schaw-Butcher Co	viii
Byron Jackson Iron Works	v	Sprague Meter Co.	iii
Chaplin-Fulton Mfg. Co.	vii	Standard Underground Cable Co	vii
General Electric Co.	ix	Steiger & Kerr Stove & Foundry Co.	vi
General Gas Light Co.	ii	Wagner Electric	vii
Holsey, N. W., & Co. 4th page cover		Westinghouse Electric & Mfg. Co	x
Johns-Manville, H. W., Co.	v	Welsbach Company	iv
Pacific Telephone & Telegraph Co. 2d page cover		White, J. G., Engineering Corporation 2d page cover	
Patriek & Co.	viii	Wood, R. D., & Co	v
Pelton Water Wheel Co.	viii		



In the center of the Exposition grounds. The Tower of Jewels.
A corner of the Fountain of Energy is seen on the right.

The Most Beautiful Exposition in History

The following is the first of a series of articles in which it is proposed to afford readers of PACIFIC SERVICE MAGAZINE who may not have had an opportunity to visit our Exposition some insight into its immensely interesting features. Editor PACIFIC SERVICE MAGAZINE.

By FREDERICK S. MYRTLE

THE Panama-Pacific International Exposition has broken all records.

It has been pronounced the most beautiful of World's Fairs from every point of view.

Scenically, it is beyond compare. No need to tell our brethren of the West what they already know. Never had an exposition such a stage-setting. Stand where you will within the grounds and your eyes feast upon a scene of wondrous beauty. It must be an experience to be remembered for all time for the stranger from afar to enter the Golden Gate in some floating palace of transportation and glide smoothly and pleasantly through the channel, the Marin hills on one side, the fir-topped slopes of the Presidio on the other, until, upon rounding the point at Fort Mason, the full glory of the Exposition city bursts into view. The great influx from the East and abroad has not yet reached the Pacific Coast—though a great part of it is on the way—but we have had with us already a few men of travel and experience who are qualified to give an opinion worth listening to, and, one and all, these men have said that never in the history of expositions has any such scene been presented to the eye.

Its architectural beauty has been accepted as rarest of the rare. No structural jumble this, but a matchless arrangement of exhibit palaces and state and foreign buildings in perfect harmony, one with another, and in such compactness that although there is no crowd-

ing of any kind—on the contrary, the suggestion of air-giving space is everywhere—the whole scheme has been so put together that no thought of distance occurs to the visitor's mind as he passes from one part of the Exposition to another.

The wonderful color scheme that has been worked out as part of the stage-setting of our Exposition is responsible in no small degree for the feeling of complete satisfaction that one has in taking in the whole arrangement at a comprehensive glance. This, perhaps, is best done from the top of one of San Francisco's many hills nearby. It is a color scheme that never offends. It lends itself to every phase of San Francisco's somewhat changeable climate, and is displayed to equal advantage under the illumination of the sun's rays by day and the more striking splendor of an artificial illumination by night.

The Exposition's art feature, of both painting and sculpture, has been the theme of many writers already and will be the theme of many more. The best talent this country could produce has been brought to the front, and there is a lavish profusion of the most beautiful mural decoration and sculpture work, each piece doing its part in symbolizing the general scheme of this great Exposition that has been given the Western land.

And, in this color scheme must be included something in which Dame Nature has assisted man's art. Surely no Fair of any kind ever nestled in semi-tropical

garden of such bewildering loveliness, with such profusion of flowers and trees and shrubs and velvet lawns. There is not a bare wall from one end of the Exposition to the other. The very fence that stretches its way from gate to gate, dividing the Exposition city from the outer world, is a hedge built entirely of mesembryanthemum, the South African marigold.

It is said to be the first Exposition that opened on schedule time physically complete. For, physically complete it was when the gates swung open to the world that glad February morning. Not a plank of scaffolding to mar the complete beauty of the whole. True, some of the exhibit palaces lacked portions of their promised contents. But that was unavoidable in view of conditions abroad, and the gaps are being rapidly filled up. President Moore and his directors promised that their part of the great work should be finished and in a position to be handed over to the people of the nation whose trustees they are on the appointed day. Nobly they kept their word.

The Exposition, too, has proved a record-breaker in point of attendance. So far, the pessimists who took pains to point out the remoteness of our Queen City of the Pacific from the great centers of population, the distance of mountain and desert on the one side, of ocean on the other, lying between San Francisco and her sister cities of the great world outside, who were ever ready with statistics showing the small percentage of native population counted in the sum-total of patronage of affairs of the kind, have, up to date, found their gloomy predictions scattered to the four corners of the earth. They reckoned without their hosts. They forgot one thing that has played a greater part than anything else in giving our Golden State of California a distinctive character, one all her own, namely, that the Californian is an open air-loving, pleasure-seeking, show-going citizen.

At this time of writing, twelve days have gone by since the gates of the Panama-Pacific Exposition were opened for the first time. The records show an unprecedented attendance. Beginning with the first day, the attendance, noted by faithful tabulation at the entrance gates, reached 250,000 souls. Let the World's Expositions that have gone before compare this tally with theirs, if they will. The total of admissions to date, twelve days, is given at 938,680. It is observed, also, that the average of week days' attendance keeps steadily at 40,000 to 45,000, with, of course, a much larger concourse on Saturdays and Sundays. For, this is a seven-day show, with everything from one end to the other open to the visitor within stated hours.

Generally, the Exposition may be said to have exceeded expectation. In no particular can it be said to have disappointed. True, the critics point out this and that feature as more worthy of commendation than another, but even in this process of selection they do not all agree. It must be remembered that this is not a mere spectacle to be seen and appreciated as such. It is rather a world's lesson to be gathered in, to be absorbed. To attempt to see the Exposition in a stated number of days, the usual brief period, say, of a passing visit to a big city, is out of the question. The Exposition is like some great work or collection of works; something to be taken seriously, to be studied, its contents and their meaning mastered, an education in themselves of lasting benefit to one fortunate enough to receive it and retain it.

One instance may be given of an object lesson which one section of this Exposition affords. If you visit the building sacred to the Dominion of Canada you will see therein an exhibit of an eminently practical, up-to-date character. The Canadians have made the most of their opportunity to show the great world outside their territory what they are doing in the way of progress and development and what a pleasant land their settlers



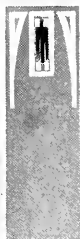
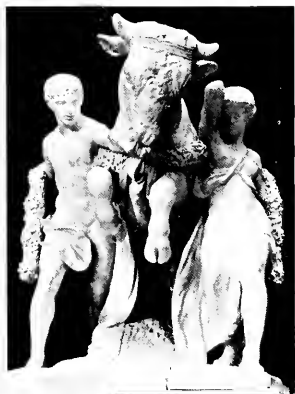
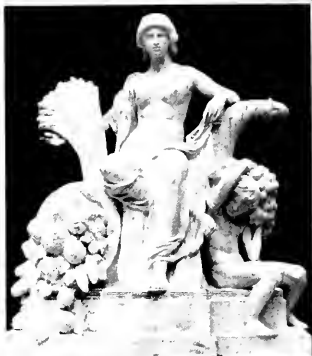
"The End of the Trail." By James Earl Fraser. Placed at entrance to Court of Palms.

have made of what was once a vast wilderness. Inquiries have elicited the fact that this form of exhibit was established by the Canadian government fully ten years ago, since which time it has been shown all over the world. And now, we of the West have absorbed the lesson it imparts. Already there is a movement on foot for a permanent Californian exhibit that shall rival the Canadian in revealing to the world the treasures of peaceful and plentiful prosperity that our Golden State holds within its confines.

It is not the writer's purpose in an article of this kind to attempt to describe the Panama-Pacific Exposition in all its details. Statisticians have figured out various lengths of time that must be con-

sumed by the student desirous of mastering our world's show in its every detail. These lengths of time run from months to years, according to the scope of the statistician's range of view. The one satisfactory way to learn about the Exposition is to see it and study it for yourself. However, there has been so much said about the exterior beauties of the Exposition that perhaps it may not be amiss to treat of these in a general way, in order to afford the reader some idea of the designs that were carried out by those to whom the decorative part of the structural work was entrusted.

You begin, say, with the main group of exhibit palaces in the center of the Exposition grounds. Entering by the gates



Some sculptural features of the Panama-Pacific Exposition. Reading from the top downward, left to right, these are: "The Setting Sun," Court of the Universe; "Harvest," Court of the Four Seasons; "Bull Group," Court of the Four Seasons; "Autumn," Court of the Four Seasons; "Fountain of Energy," South Gardens.

at the foot of Scott street you find yourself opposite the much heralded Tower of Jewels, the gateway to the central court of the Exposition, the Court of the Universe. In the open space of the South Gardens, between you and this Tower of Jewels, stands a striking piece of Exposition symbolism, a lofty fountain and figure representing "Energy," the victor of the Isthmian way. This reveals an Homeric youth forcing his way on horseback through gushing streams of water. It is the work of A. Stirling Calder, the acting chief of sculpture.

Passing on, you come to the Tower of Jewels, a structure 430 feet high and decorated in the color-scheme of the Exposition, decidedly Oriental in effect. In the center of this is a 60-foot archway, with statues of Pizarro and Cortez as mute sentinels on guard, through which you pass to the Court of the Universe, ten acres in extent. On the east and west sides are colonnades, the first surmounted by a group symbolizing the nations of the Orient, the other by a group symbolizing the nations of the Occident. These groups are forty feet high and are the work of A. Stirling Calder, Leo Lentelli and F. G. Roth, in collaboration. Dominating features of this central court are two fountains with 70-foot columns representing, respectively, the rising and the setting sun, by Adolph A. Weinman. Flanking

these fountains at the level of the descent into the sunken gardens there are four colossal reclining figures symbolizing the four elements Earth, Fire, Air and Water. These are the work of our own native son, Robert I. Aitken. Beneath the domes of the pavilion of this court is a lengthy frieze representing the Signs of the Zodiac, by Herman A. MacNeil. Flanking the Tower of Jewels just inside the court are two pieces by American women sculptors; that at the east corner represents the Fountain of Youth, by Edith Woodman Burroughs, that at the west the Fountain of Eldorado, by Mrs. Harry Payne Whitney. At the north entrance to the court, pointing baywards, stands a colossal sentinel, the Column of Progress, surmounted by a figure of an adventurous bowman; this the work of MacNeil.

To the east of the Court of the Universe and surrounded by the palaces of Varied Industries, Mines, Transportation and Manufactures, is found the Court of Abundance, an exquisite specimen of Gothic architecture designed by our own Louis Mullgardt. This, while not so large as the Court of the Universe, is profusely decorated. The striking sculptural features are located on the main tower on the north side and in the center. Mr. Robert Aitken's Fountain of the Earth is a symbolic treatment of the idea of human progress. It is something to see this



Group surmounting the Arch of the Rising Sun. Group surmounting the Arch of the Setting Sun.
In the Court of the Universe.



Genii of Machinery. Figures at the base of columns in the Palace of Machinery.
By Haig Patigian, the California sculptor.

court lit up at night. One feels as if one were within the walls of some huge cathedral, with incense burning all around him in multi-colored flames.

In front of this Court of Abundance, between the facades of the palaces of Varied Industries and Manufactures, there is a small Court of Flowers, distinguished by a central fountain, "Beauty and the Beast," by Edgar Walter, and an equestrian statue, "The Pioneer," by Solon Borglum.

To the west of the Court of the Universe is found the Court of the Four Seasons, where there are some especially striking sculptural groups. Above the half dome on the south side is a group representing "Harvest," the work of Albert Jaegers, who is responsible also for two beautiful figures on columns, representing, respectively, "Rain" and "Sunshine," and two groups, "The Feast of Sacrifice," surmounting two corners of the forecourt.

There are also four groups symbolizing, respectively, the four seasons of the year, by Furio Piccirilli, while in the forecourt another woman sculptor, Evelyn Beatrice Longman, comes well to the front with a picturesque fountain representing "Ceres," the goddess to whom the farmers make their prayers.

In front of this court, between the facades of the palaces of Liberal Arts and Education, is a Court of Palms, distinguished for a striking equestrian statue, "The End of the Trail," by James Earl Fraser. Many an early settler pauses as he reaches this. It conveys to him a reminiscence of the long, long ago.

At the east end of the main group of palaces stands the colossal Palace of Machinery, for which the most important sculptural work has been executed by a local sculptor, Mr. Haig Patigian, whose four statues, representing, respectively, Steam, Electric Power, Invention and

Imagination, surmount columns along the facades of the palace.

The western plaza facing this Palace of Machinery is to be adorned by a group representing "The Genius of Creation," the work of the dean of American sculptors, Daniel Chester French.

In this sketch the writer has touched what he believes and understands to be the high spots only. There is a wealth of sculpture in and around not only the exhibit palaces but other buildings of the Exposition. The Palace of Fine Arts, itself the most beautiful of anything to be found in the Exposition grounds, is decorated inside and out with the work of famous moulders of clay and chisellers of stone. But it would take a worthier pen than the writer's to say nothing of an endless amount of space, to treat this feature of the Exposition as it deserves to be treated.

Mural painters have done wonders in helping out the decorative symbolism of our Exposition. Those represented include six Americans from the east, du Mond, Reid, Simmons, Dodge, Hassam and Bancroft, one Englishman, Frank Brangwyn, and our own Arthur F. Mathews of San Francisco. Their work is all in harmony with the general color scheme designed by and carried out under the personal direction of Mr. Jules Guerin.

Edward Simmons has executed two panels for the interior of the Court of the Universe. Commencing with a savage from Atlantis, that mysterious isle of ancient fable, he has shown various types of adventurers who have crossed the Atlantic, down to the modern immigrant. As a background in this panel, Simmons has used the ships from the



"Steam Power."
Haig Patigian.

earliest vessel down to the most modern ocean greyhound. In the other panel he has embodied some of the visions and ideals which led these brave men to battle the dangers of the sea.

Frank Brangwyn's work adorns the Court of Abundance. His two brilliant pieces of color are termed "The Fruit Market," and "The Mosque."

A symbolical presentation of the historical phases of the completion of the Panama Canal form the main theme of the two great canvases of William de Leftwich Dodge, which are located in the interior of the gate to the Tower of Jewels, one on the eastern side and one on the western. Balboa is the central figure of an allegorical picture showing the discovery of the Pacific Ocean. The central panel

of this canvas shows a giant figure of labor sundering the last barriers of each between the oceans and joining the waters of the Pacific and Atlantic. On the right is a symbolical group emblematical of the purchase rights of the canal from France. A typical French woman passes a scroll to Uncle Sam, who returns her a bag of gold, while in the background are the departing French laborers and the oncoming American toilers.

Mr. Robert Reid has executed eight panels for the rotunda of the Palace of Fine Arts. The artist has divided his general scheme into two series of panels, four containing symbolical groups, and four being confined to single figures. In the first division is presented the "Birth of European Art"; in the second the "Birth of Oriental Art"; in the third the "Ideal of Art," and in the last one "The Inspiration of All Arts." The single figures are symbols of the four "Golds" of

California — the poppies, citrus fruits, wheat and gold, the metal.

The work of H. Milton Bancroft decorates the Court of the Four Seasons. It is symbolical of the seasons, needless to say, and also descriptive of man's activities in life. Childe Hassam has a panel in the Court of Palms, and Arthur Mathews one in the Court of Flowers. Incidentally, Mathews and Francis McComas, another Californian artist, have a room all to themselves among the exhibits in the Palace of Fine Arts.

Concerning the exhibit palaces. That devoted to machinery, the largest structure of its kind on record, houses some colossal exhibits. When you visit there you should linger by the great Pelton water wheel, and when you do you will remember that this has been constructed for our company, for use in one of our projected hydroelectric developments up country. Special mention, also, should be made of the Babcock and Wilcox Company's exhibit, and of the displays made by the Westinghouse and General Electric companies, both of which are represented in more than one exhibit palace. It is proposed to treat of special exhibits in future numbers of PACIFIC SERVICE MAGAZINE. There is something of interest to members and friends of "Pacific Service" in all of them. In the Palaces of Transportation, Mines, Liberal Arts and Agriculture you will find as much to engage your scientific attention as in Machinery Hall. It must not be supposed, either, that electricity has the field to itself. Gas plays a most important part in the exhibit line, as you have already been told. The Collective Gas Exhibit in the



"Electricity."
Haig Patigian.

Palace of Manufacture is now nearing completion. It will be something worth seeing.

Leaving "shop" for a moment, be sure and hear the great organ in Festival Hall and see McLaren's orchid exhibit in the Palace of Horticulture.

The state and foreign buildings have each its own particular point of interest. Of the state buildings that dedicated to New York state is generally conceded to have the most elaborate and best decorated interior, while our own California building attracts the eye of the visitor from afar because of its picturesque Mission style of architecture.

The writer wishes that he could describe the wondrous scheme of illumination that makes a veritable fairyland of these groups

of buildings and courts at night. Failing the power to do so, his advice to the gentle reader is: Go and see for yourself and, seeing, you will marvel greatly. And, if your heart will allow your mind to come down to mundane things, you will give at least a crumb of praise to "Pacific Service" that has supplied equipment and the energy to make this wonderful artificial illumination possible.

San Francisco has substantiated her assertion that she "knows how." California feels proud that her Queen City has proven equal to the great opportunity given her. The United States acclaims the Golden State as a worthy hostess to the nations of the world. In a word, the big Fair has made good. Unqualified, unstinted are the words of praise that have been spoken and written since the gates swung open to the world on that day that will live forever in the memory of Western men.

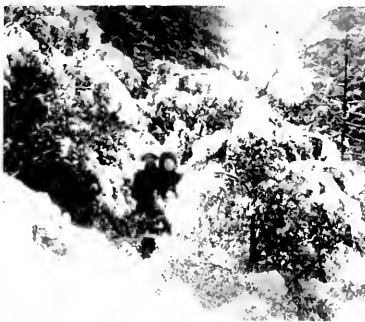
Pacific Service vs. Winter Snows; a Trying Experience

By JAMES F. POLLARD, O. & M. Department, Hydroelectric Section

HAVE you ever had the experience of picking a duck? Do you remember that fine soft down off the breast, so light and white and fluffy? Those uncontrollable little featherlets that insist on wandering throughout the house, decorating impartially the parlor brussels and pa's Sunday broadcloth, locked securely in the closet of the spare bedroom on the third floor? Can you imagine the big out-of-doors literally filled with these fluffy bits of down, lazily drifting out of a gray sky? Then you will have a fair idea of a high Sierra snow-storm.

It is a beautiful sight as one sits, on a winter's afternoon, looking out through the window of a warm and cozy cabin. The pines, straight military giants of the forest, begin to take on festive draperies of purest ermine. The buildings of the little camp are covered with a new roofing, even while one watches—a smooth, even coating of glistening white, which hides old scars and many patches. If the camp happens to be the little settlement gathered around a great "Pacific Service" power-house, such as the one at Drum, the scene will include many poles and wires where the drifting flakes will find lodgment. As dusk begins to close in around one, the imagination is aided by its eerie spell. The telephone poles seem to take on the form of ghostly spectres staggering 'neath the weight of the wires they bear, which have grown to the

dimensions of heavy hawsers for all the world like ships' cables bleached to a perfect white by long exposure to wind and sun and fine salt sea-spray. The stumps of mighty trees make one think



A peep through snow-laden bushes.

of huge birthday cakes freshly iced by a generous hand. In an inconceivably short time the whole rugged country and everything upon it becomes coated with a thick layer of pure white snow, so smooth and soft in appearance that one instinctively feels that old Mother Nature has wiped the slate clean and is

again ready for a new start.

Such is the delightful scene from "the inside looking out." Our friend, the pessimist, may use another adjective to describe it after he has stayed with us through the tale we have to tell of a small party of "Pacific Servers" who experienced such a snowstorm from the outside in, as it were.

One afternoon in December a heavy, wet snow began to fall. The clouds had been steadily gathering for several days and the old-timers with many a sidelong glance at the sky and many a canny shake of the head had predicted a "stem winder." For this once at least the old-timers proved to have made correct prognostications. The next morning Drum awoke to a world buried beneath about ten inches of snow, and those who were accustomed to the normal sound of the great generators awoke to a new and unusual note in their song.

It was soon learned that early in the morning trouble had come in over the transmission line. After the usual tests had been made, the fact was established that the trouble was on the Drum line and that it was somewhere in the mountain divisions. A patrolman was started at once over the tower line. Before noon he was back with the news that the line was down in Dewey canyon. New material and tackle were needed to mend the break, and while some at least might have been furnished from the power-house there was no available means of transporting the heavy gear across the three miles of rugged, snow-clad country that intervened. The quickest means of obtaining the necessary equipment was to ship it to Towle by express from the Sacramento supply department and haul it in by wagon road. Allowing the shortest possible time to accomplish this still

made it impossible to get at the repair work before the next morning.

That night two operators and the machinist started out from Drum afoot. The next morning Power-house Foreman Henley followed to take charge of the work. With him went another operator and a laborer. In the meantime men had been sent in from other points; a lineman from Towle; another from Colfax, and an operator from Alta. Before work could be started the Deer Creek-Alta line went down not a half of a mile away from Dewey canyon. As this promised to be only a short job the whole party went to work to fix it up first. When they began only light rope and tackle were available for pulling up a long heavy span, and two attempts failed because of parting of the lines. It began to look as though nothing further could be done until heavier gear was obtained.

It was at this juncture that our superintendent of transmission lines, Mr. E. H. Steele, arrived with District Manager James Martin from Colfax. They were followed by the wagon from Towle bringing the material from the Drum line. A heavy set of double blocks reeved with about a thousand feet of inch-and-a-half rope was quickly unloaded, and all hands were called to stagger through the snow under this unwieldy load of several hundred pounds, "packing" it for a couple of hundred yards from the road to where the work was in progress.

Long before this the storm had broken again in all its fury. The wind was blowing fiercely, lashing the faces and filling the collars of the men with icy pellets, half snow and half sleet, far different from the soft downy flakes of the first day's fall. A cold that penetrates was fast benumbing the feet that were constantly buried in the frigid ground covering. There was much pulling and tugging at ropes; adjustment of "come alongs"; fighting stiffly frozen ropes into secure knots; and fighting these same knots out again with fingers ever more stiff and numb. Until, at last, the line was back



Winter view on the Drum tramway.



in place, ready to carry along its slender path thousands of horse-power that Deer creek would be pumping over it.

Next came the task of coiling that heavy hawser and reloading it for transportation to the second job. It took six men to accomplish this after wrestling its cold, stiff, stubborn length through the snow. Reinforcements were added now in the persons of a wagon-load of laborers from Colfax, and all hands trudged through the snow to Dewey canyon. Here it was necessary to uncoil a thousand feet of copper cable. A wagon wheel laid on a convenient stump was pressed into service as a reel and the new men were started out dragging the heavy cable through the snow, while five others were required to retain the wheel in a balanced position on the stump.

The storm was kind in the location it

chose for the damage that it did. For, not a thousand yards away is the ranch owned by the Levy boys, Dan and Bill. Noon time arrived while the cable was being uncoiled, so all hands repaired to the Levy house for lunch. This old farmstead, which has stood here since the boom days of the gold-seekers, is worthy of a closer inspection, as are also its inmates. There are not very many rooms. There is a two-story portion containing kitchen, dining-room and two bedrooms which is supplemented by an "L" at the back giving two or three more sleeping

apartments. And yet the place is a lesson in expansion and hospitality. Bill Levy, with his clear blue eyes and cheerful, kindly manner, and his brother Dan, larger of frame and more reserved of mien, together with their aged mother, make up the regular household. When 1



Snow-scenes at Drum: The pipe-line. The power-house. Winter quarters at Drum.

tell you that ten of the "Pacific Service" men, besides Mrs. Hepner and her daughter, were comfortably housed there that night you will see what I mean by the expansibility of the house.

Fred Hepner has long tended the company's Yuba ditch above Bear valley. He

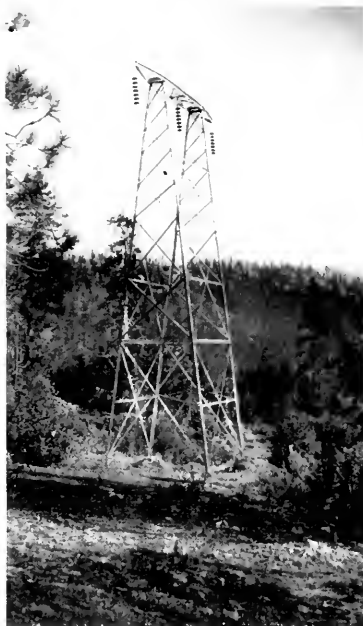
must be a very astute man, as demonstrated by his choice of Bill Levy's sister for his helpmeet. A woman large of stature, as also of heart and good nature, she willingly stepped into the breach to help out her brothers by taking charge of the culinary department. Under the stress of the unexpected arrival of such a horde of guests a less capable woman might have been dismayed, a less genial one might have balked. Fortunately for the men she did neither. But with a kindly word for all and an ever-cheerful smile she plied the art of which she is a mistress and set the tables for twenty-two extra guests at that first dinner. It was but a very short time until that company of storm-harried men were warmed and cheered by an abundance of hot biscuits, potatoes, carrots, macaroni, beef-stew and tea, topped off with real pumpkin pie. In spite of wet clothing and wet feet these kindly ministrations of Mrs. Hepner were potent in sending all forth after lunch, heartened for the struggle with the elements which had in nowise abated their fury.

Much time might be spent in detailing the happenings of the afternoon, telling of the benumbing wind that, unobstructed, lashed the men who worked aloft on the steel towers; how those who tugged at rope and tackle from the ground felt their fingers growing stiff and

ever stiffer, or venturing to look upward had eyes blinded by snow; how Mr. Martin and Mr. Steele were everywhere directing the work and, when necessary, lending a helping hand; how at one time it seemed that progress was definitely blocked by the loss of a small half-inch pin out of a temporarily dismantled string of insulators; how a sheepish lineman finally produced the pin from the depths of a pocket where previously repeated search had failed to reveal it to cold stiffened fingers; how the line was finally secured in place and

cleared by lantern light long after the cloud-filtered rays of the sun had ceased prosecuting their system of indirect lighting; and how at last the job was finally wound up by coiling again that long, heartbreaking rope. But all of this would be mere detail.

The important feature of the whole job, which will be long remembered by those who stopped to consider it, was the spirit that filled every member of the gang. "Service" was the keynote. With all the discomfort, not a footstep lagged,



Steel-tower in the snow-belt. Drum-Cordelia transmission line.

not a complaint was heard. All displayed cheerful willingness and courage amid the most adverse and trying circumstances.

That night the teams took a number of the men back to Colfax, Dutch Flat and Towle. The ten who remained were spending the early evening, telling yarns about the fire in the heavy atmosphere of drying outer garments and footwear, when they were suddenly apprised by

succeeding flashes which lit up the country for miles around that, first, the Deer creek line and then another leg of the Drum line were down again. All that had been done and more was to be done over again.

Winter in the Sierras offers no bed of roses for those who maintain "Pacific Service" over those mountains. And yet life holds for them a very potent interest, withal.

Fighting Flood in Reclamation Districts

By J. W. COONS, Superintendent Yolo District

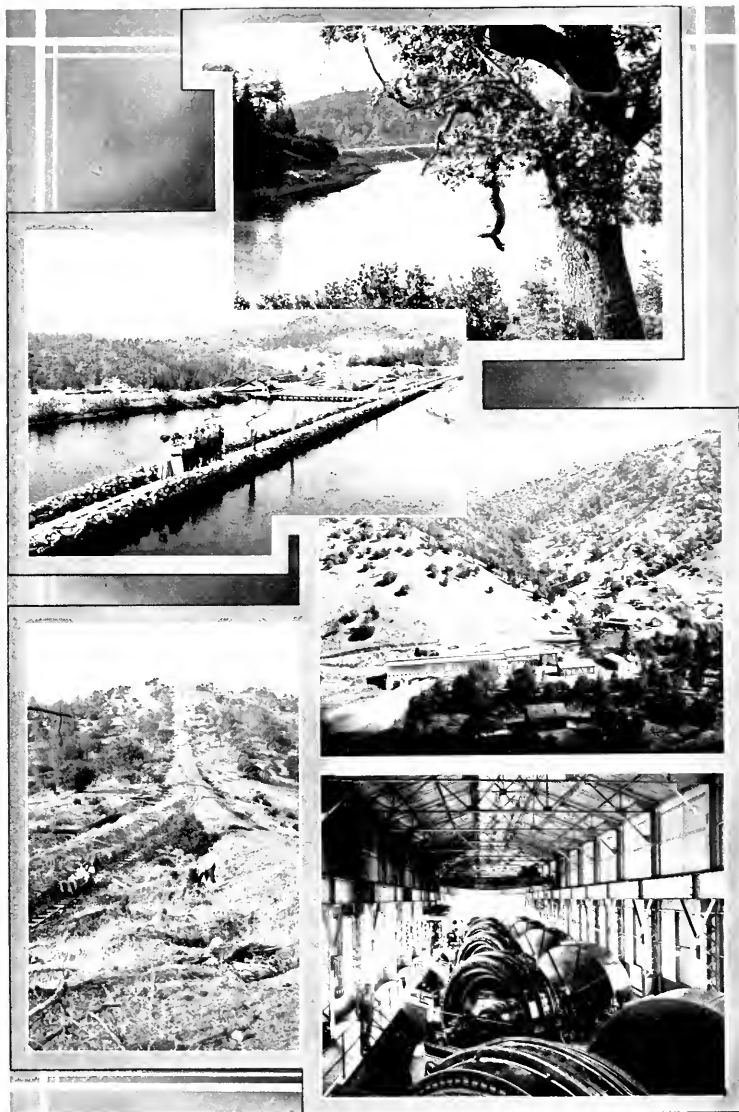
IT IS not news to most readers of PACIFIC SERVICE MAGAZINE to hear that the storms we had during the month of February were unusually severe. This district was affected more than other districts, due to unusual conditions around Knights Landing, where the floods caused about sixty miles of our pole-lines and tower-lines to be partly submerged. It is pleasing to record, however, that in face of all our troubles our company has been highly complimented on the service we were able to give. These compliments came not only from the people of Knights Landing but appeared, also, in the public press of Woodland.

The flood occurred from breaks in the Sacramento river, due to high water near Colusa and Meridian. This water first flooded the upper part of reclamation district No. 108, and also covered land west and south of the district, as the natural drain for the water in this section, which is known as Colusa basin, is through an old slough which empties into the river at Knights Landing. District No. 730 is below this slough, and is protected to a certain extent by a natural barrier which is known as Knights Landing ridge. This, however, was not high enough to prevent them from being flooded, so they put a large crew to work placing sacks on the lowest part of the ridge. The water rose to a height of three or four feet

above the height of the ridge, and this backed water up into the Colusa basin, until the water broke into lower district No. 108, which gave relief while that section was filling with water.

An owner of land in the flooded section obtained an injunction against the district to prevent sacking the ridge, and at a hearing in the Yolo court it was ordered that the sacks be removed, and that the ridge be cut down to its natural height. The ridge was cut at a point where a new canal is being dug to drain the flood water into the Yolo basin at a point below district No. 730. After a small gap had been cut in the dam the swift current did the rest, and an opening over a hundred feet wide allowed the water to rush into the district below. In all, there is over a hundred thousand acres of land under water.

This water added considerably to our troubles. We had a good many poles to guy and brace, and a new piece of line to be completed in district No. 730. Some of these poles were in very swift current, and the work was done with considerable difficulty. The machinery in district No. 730 pump-house had to be raised to keep it out of the water, and the crew that did this had to work in water, and during a greater part of one night, to keep ahead of the rising flood.



Views of Electra. Reading from top to bottom, left to right, these are: (1) Lake Tabaud; (2) the Petty reservoir; (3) general view of Electra; (4) the tramway-line from the forebay to the power-house; (5) interior of the power-house.

The Story of Electra, Recalled to Memory by the Recent Destruction of the Famous Boarding-House

By RANDALL ELLIS

The company's boarding-house at Electra, generally regarded as the model boarding-house of the entire system, was destroyed by fire on the morning of November 11th last.

The disaster came without warning. About 9.15 a. m. smoke was noticed issuing from the ventilator of the boarding-house and the alarm was spread to everyone in camp. Everyone, except the operators on duty, was on the scene as quickly as possible, but the fire had gained such headway before being noticed that it was impossible to get at the fire-fighting apparatus inside the building upstairs. Monitors and three lines of hose were played on the flames, and with the high-pressure water from the power-house turned into the system sufficient water was available, but it was impossible to save the building on account of the headway the fire had gained, aided by a heavy breeze which had come up.

There were four asleep in the building at the time, and three had to leave by the window-route, while one came down stairs, severely blistering both feet in the journey. Two boys off duty were upstairs, but were able to leave by the stairway without injury. All the single men and others that were there temporarily and were stopping at the boarding-house lost all their personal effects, being unable to get to their rooms. Those that were asleep had only just time to make their escape. Nothing was saved from the upper story, but practically all furniture and some cooking utensils and groceries were saved from the lower story.

The cause of the fire is unknown, but Manager Eskew is of the opinion that it started in the garret and may have been caused by cross-wiring. As soon as the loss was made known, an auto-truck loaded with kitchen equipment and bedding was dispatched from Sacramento and arrived the next morning. The old cook-house and bunk-houses were repaired, and eating and sleeping quarters were fixed up in quite comfortable fashion by night.

The loss will be keenly felt by all, as many happy hours have been spent in games and dancing within the walls of the boarding-house whose construction dates back to the days of the Standard Electric Company and the activities of Mr. William H. Crocker, Prince Andre Potiatowski, Mr. W. Frank Pierce and their associates in the development of electric power along the mining ridge familiarly known as the Mother Lode. The story of Electra is a most interesting one and it is here presented to the readers of PACIFIC SERVICE MAGAZINE through Mr. Randall Ellis, an engineer now in the service of the municipality of San Francisco and who was in the employ of the Standard Electric Company and helped to build the plant he describes.

—Editor PACIFIC SERVICE MAGAZINE.

IN THE series of developments culminating in the Electra power system, the first was the construction of the Butte ditch. In 1855, the miners of Slabtown, Butte City and vicinity, built a ditch and flume system to bring water to the rich placer workings south of Jackson; this system was largely flumes, was nineteen and a half miles in length with a capacity of about 750 miner's inches, and is reputed to have cost \$75,000. It tapped the north fork of the Mokelumne river at Pine Log crossing, about three-quarters of a mile below the present intake of the Amador or Lower Standard canal; as was customary in those days, the grades were about thirteen feet to the mile. During the sixties, with the exhaustion of the surface diggings, the system was allowed to deteriorate, and in 1870 it passed into the hands of the Sutter Canal and Mining Company, who started the construction

of the Amador canal, paralleling, but at a higher elevation, than the Butte ditch.

The objective of the new company was the quartz mining district of the Mother Lode in Amador, but owing to financial difficulties operations on construction were suspended in 1871 and the properties were acquired by Abner Doble, J. S. Emery and their associates, who, as the Amador Canal and Mining Company, in 1873-74 completed the Amador canal to its present terminus at the Tanner reservoir above Sutter creek, a distance of forty-two and a half miles from the intake. The construction of the Amador canal destroyed the Butte ditch from its headworks to a point above the present Electra station. The new canal was practically of the same capacity as at present, i. e., 3,000 M. I. throughout its course through the Mokelumne canyon and 2,000 M. I. from there to Sutter creek. In 1875



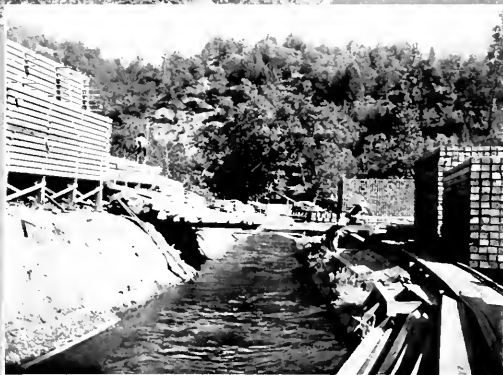
the limelight as a possible source; the project was favorably reported on by Colonel Mendell, the city's expert, but nothing developed along this line, and the company settled down to furnishing the numerous quartz mines of Amador County with water power, and the towns with a domestic supply. About sixty miles of laterals were constructed or purchased, reaching from Plymouth on the north to the Mokelumne on the south, and Ione on the west. Until 1892 there was little done on construction other than some further development of the storage reservoirs in Alpine County. In the latter year the Blue Lakes Water Company took over the properties with the announced intention of bringing

water to Oakland; a bond issue of \$5,000,000 was authorized and surveys completed to Oakland, contemplating the delivery at that point of a daily supply of 17,500,000 gal-



the company filed locations on the Blue Lakes in Alpine County, and in the succeeding seasons built the original dams at those reservoirs.

During 1874-1876 there was considerable agitation for a Sierra water supply for San Francisco, and the Blue Lakes and Amador canal system came into



Tiger creek saw-mill. The old cabin at Blue Lakes, 8100 feet altitude. Lumber-yard at Mill creek, at the head of Upper Standard canal, twenty miles above Electric power-house.



The tunnel leading from Lake Tabeaud to the penstocks.
This is now seventy-two feet under water.

lons at an estimated cost of \$3,500,000. With the financial stringency existent during 1893-1894, no further progress was made on this scheme, but in 1895 the control of the Stockton Water Company was purchased with bonds of the Blue Lakes Water Company.

Early in 1896 W. Frank Pierce became heavily interested in the Blue Lakes Water Company, and assumed active control of its financial affairs. The entrance of Mr. Pierce into the operations of the company marked the beginning of a new era. About that time Prince André Poniatowski (now serving with the French army at the front) and his associates bonded a number of mining properties in Calaveras County and founded the California Exploration Company, Ltd. Their program contemplated the extensive development of these mines, and to provide the requisite power negotiations were entered into with Mr. Pierce, resulting in

the California Exploration Company advancing \$122,500 toward the construction of a power plant, this sum to be repaid in power. The old Kearsing mill site belonging to the Blue Lakes Company, and situated on the Mokelumne river about one-half mile above Big Bar bridge, was selected for the power site and active construction began in August, 1896; the installation was completed in July, 1897. The camp had the ambitious title of Blue Lakes City and with its three 450 K. W. machines, operating under a 1040-foot head, was considered as a hydro-electric plant of some consequence in those days. The water for operation was diverted from the Amador canal through four miles of the original Butte ditch, enlarged to meet its revived importance.

In the following year, 1898, Messrs. Pierce and Poniatowski took under consideration the development of a much larger

power plant with transmission lines to the bay region. As a result of the studies made during that year the Standard Electric Company was formed, the stock of the Blue Lakes Water Company acquired, and the active construction started. In the spring of 1899 a pole line from Blue Lakes City to Stockton was completed, and for the first time the little plant approached a full load for its three machines; its glory was short-lived, however, for on November 1, 1899, the station burned down. The origin of the fire was a mystery, but indications pointed to a short circuit on the switch-board igniting the oil-soaked wooden transformer gallery above. The plant was temporarily rebuilt in 1900 and operated until the completion of the Electra station in 1902.

The work during the season of 1899 was largely confined to transporting material and establishing camps at Bear river, Blue Lakes and Meadow lake. A



The boarding-house at Electra, recently destroyed by fire.

new power site, the present Electra site, near Spanish Bar, three miles above Blue Lakes City, was chosen. In 1900 work was commenced on the new or Upper Standard canal, which paralleled the old Amador canal at a higher elevation of about two hundred feet; the power site was prepared, and work prosecuted on the storage reservoirs. In the fall of 1900 Frank Pierce, who had been East, occupied with the purchase of material and equipment, assumed control of the construction program. He took a personal interest in the welfare of the men, and by improving the boarding-houses, abolishing the medical tax, and similar measures, he endeared himself to the laborers. "Pa" Pierce, as he was familiarly called by everyone from the water bucks to the superintendent, was always a welcome visitor along the line.

The season of 1901 was one of marked activity; between Electra and Blue Lakes there were about fourteen camps operating with fifteen hundred men. During

this year the major portion of the canal and flume system was constructed, the Tabeaud dam and tunnel completed, the greater part of the electric and hydraulic equipment at Electra installed, and considerable progress made on the storage reservoirs.

February 8, 1902, the first water was carried through the new canal; this was increased to a full head by March 3d, the first water was turned into Tabeaud on April 19th, and on May 6, 1902, the testing having been completed, the Electra station took on the commercial load of the old Blue Lakes City plant, which thereafter ceased to operate.

Work on the storage reservoirs was continued during 1902 and 1903. Bear river was completed in 1902, Meadow lake and Lower Blue Lakes in 1903. Prior to 1899 the storage capacity of the reservoirs was 360 million cubic feet. The operations during 1899-1903 practically tripled this amount, and the resultant storage in 1903 was 1,026 million cubic feet.

At the Blue Lakes the working season was of short duration; situated at an elevation of over 8,000 feet, the surrounding country is under snow during a greater portion of the year. It was ordinarily planned to open the camps early in May, and the crews at that time had a considerable march over the snow to reach the lakes. The roads were usually not open until early in July, and the first teams bringing fresh beef were hailed with delight, after a six or seven weeks' diet of corned beef and canned salmon served in various forms, with liberal portions of sauerkraut to offset the tendency to scurvy. The crews would actually gorge themselves with the fresh meat, and the camp dispensary would be kept busy for a few days. The location of the Lakes was ideal for working during the summer, but with the first flurry of snow at the September equinox the men would get restless, and it required the inducement of free board after October 1st to hold a sufficient crew until closing down, usually in the latter part of October. Due to

the isolated location of the Lakes, about eighty miles across the mountains to the towns in Amador and fifty miles to Carson, Nevada, there was little floating labor to recruit from, and the crews were selected with some care prior to the opening of the season. Construction material was expensive, as the freight rate from San Francisco to Carson was almost equal to that from the East to San Francisco, and the team haul of fifty miles from Carson further increased the cost. As an indication, cement laid down at the Lakes cost \$8.00 per barrel. This was a determining factor in selecting a type of dam such as that for Meadow lake, namely dry rock fill.

The log cabin which has been used for many years as a headquarters at the Lakes was built in the seventies and was often referred to as the most substantial house in Alpine County; when you consider that Alpine County casts between eighty and ninety votes this may not have been an idle boast.

One odd feature of the Blue Lakes con-



Group at end of new ditch, July 27, 1901. Mr. W. Frank Pierce is seen in the foreground, while in the group, reading from left to right, are: Mr. A. F. Morrison, Mr. T. S. Bullock, Mr. Randall Ellis, Prince Andre Pondatowski, Mr. N. A. Eckert, Mr. A. G. Seurfield, Mr. C. E. Green and Mr. William H. Crocker.

struction was the Indian camp. Captain Pete Mayo and his tribe of Alpine Washoes were a regular part of each season's construction crew. Some years previously the Blue Lakes Company had presented the captain with a gold watch accompanied by an ornate document extolling his merits and that of his tribe, and thereafter he considered himself as a sort of silent partner in the enterprise. His crew of about thirty men were excellent workers in the woods, although of little use on rock work.

The first two winters of operation of the Upper Standard canal were fraught with much grief. With a perversity inherent in new ditches it refused to "stay put," and slides and breaks were of frequent occurrence. Some of the "trouble reports," while amusing to read over now, were written at the time in a deadly serious vein.

The value of the Tabeaud reservoir was amply demonstrated, as with its large storage capacity at the head of the pipe

lines it permitted the plant to be operated for several days at a time, when the flow through the canal system was interrupted.

The Electra boarding-house, which recently burned down, was familiarly known as the "big house"; it was designed and furnished under the personal direction of Prince Poniatowski, and during the construction period was the headquarters for the executive force and for the numerous visitors to the works. It was the scene of many pleasant affairs, and it always held a fond spot in the memories of those who were associated with the construction of the system.

In March, 1904, the Standard Electric Company was purchased by the California Gas and Electric Company and thereafter became a division of their extensive system.

It is a far cry in water development from the rockers and "long toms" of Butte City, in the fifties, to the present 20,000 K. W. installation at Electra.

A Warning to Mischievous Boys

Serious consequences often result from heedless acts. It is dangerous to play with wires in the vicinity of high-tension lines, and when the mischief is done it is too late to say, "I didn't mean it."

On January 16th of this year a fourteen-year-old boy at Lincoln tossed a piece of baling wire into the air, the wire falling across bay line No. 3 shorting the three phases and burning them in two. The disturbance naturally affected the entire system and might have caused injury or death to persons besides serious damage to oil switches, transformers and generating apparatus. Fortunately, nothing of the kind occurred. Outside of the cost of making repairs to the line the principal trouble that resulted was the interruption to service.

The boy who threw the wire, as soon as he found out what he had done, im-

mediately notified the company's representative at Lincoln, and has since sent in a letter of apology for his act, in which he disclaims any wrongful design.

The act in itself is a crime punishable by a prison sentence, but in this case it is apparent there was no malicious intent. On the recommendation of the District Superintendent the management decided to accept the boy's apology, and the facts in this case are being published with the hope that all of the boys of this State will either read or hear of it, and that it will serve as a warning to them in the future not to throw any wires in the air near any pole lines.

Where "Pacific Service" Crosses the Strait of Carquinez; the New System of Cables and Towers

By GEORGE H. BRAGG, O. & M. Department, Hydro-Electric Section

DURING the year 1900 the Bay Counties Power Company completed the construction of two 60,000-volt lines from Colgate power-house to Oakland. These lines, which have been in commission ever since, upon leaving Colgate traverse a route in a southwesterly direction, passing through the towns of Wheatland, Woodland, Davis, Dixon, Suisun, and Cordelia, thence to the narrow Carquinez Strait in the San Pablo arm of San Francisco Bay, where massive towers carry the conductors at a safe height above the water to the south shore in order to continue the lines to Oakland.

The strait of Carquinez is a very busy thoroughfare for deep water ships, and in view of this fact the cables were given a generous clearance above the tallest masts and the towers, large factors of safety. It was a gigantic undertaking at the time it was constructed, as no precedent had been established from which experience could be gained.

The ends of the four cables were an-



Tower saddles on which cables rest.

chored into blocks of concrete buried in the ground on each side of the strait and three towers supported the cables high in the air above the water. Two of the towers, namely the Main Tower, 224 feet high, and the Leaning Tower, 84

feet high, are located on the north side of the strait and the third, called South Tower, 64 feet high, is located on the south side of the strait.

On the tops of the towers porcelain insulators, similar to those used on the lines, were cemented on metal pins set on wooden crossarms. The cables rest in sheaves on the tops of the insulators. At the ends of the cables mica sleeves immersed in oil completely insulate the cables from the ground and, at the same time, withstand the strain of tension on the cables.

During these fourteen years of continuous operation, this unique piece of engineering has never failed, in spite of the fact that it is situated in a territory where the atmosphere is laden at all



Style of old cable anchor.

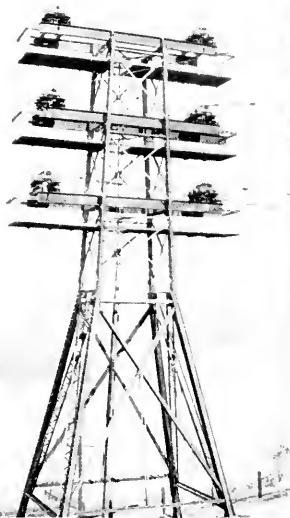


Style of new cable anchor.

times with heavy salt fogs and acid fumes.

And now the continuous demand for more power around the bay region during the present year has necessitated the addition of two more cables, which, with the original four, now provide two independent three-phase lines across the strait where but one existed previously. Thus we are now enabled to deliver double the amount of power from the

cables which manufacturers have now to offer, it became evident that the old ones were as good, if not better, than any of the others, and, besides, their past record left no margin for improvement. They



The new South Tower at Crockett.

power-houses in the north to the large load centers in the south.

It may be of interest to note that the two new cables are identical in construction to the four original ones. After a thorough investigation of all kinds of



The old South Tower at Crockett.

consist of 19 strands of galvanized plow steel wire twisted into cables, each having a diameter of seven-eighths of an inch and a breaking strength of about 48 tons, which is equivalent to 215,000 pounds per square inch; whereas, the normal strain in each cable as suspended across the strait is about 11 tons. Each cable was furnished in a single piece 6,300 feet long. The clearance above high water is approximately 216 feet. Considerable change in the construction on the tops of the towers was necessary in order to properly accommodate

the two additional cables. The four wooden crossarms were replaced by three pairs of steel I-beams which overhang both sides of the towers. The cables rest on saddles at the extremities of these beams. The planes of the two circuits

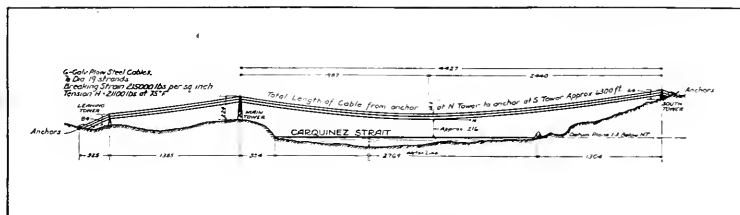


Diagram of cable and tower construction, showing 1,427-foot span.

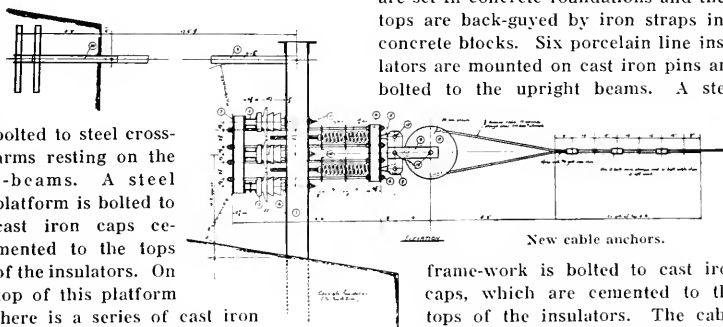
are approximately 20 feet apart and the vertical distance between conductors is approximately 10 feet.

The tower-saddles consist of six pin-type porcelain line insulators cemented on cast iron pins which, in turn, are

bolted to steel cross-arms resting on the I-beams. A steel platform is bolted to cast iron caps cemented to the tops of the insulators. On top of this platform there is a series of cast iron sheaves supported on an arc of a circle. The cable finally rests in the grooves of these sheaves. The principal feature of design of these saddles consists of the provision for changing insu-

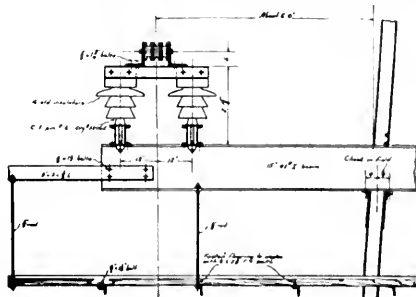
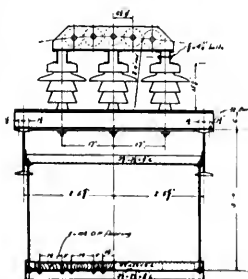
lators, in case one should be broken, and the elimination of inflammable material.

The design of the anchors at the ends of the two new cables embodies practically the same ideas as contained in the design of the saddle. Two steel beams are set in concrete foundations and their tops are back-guyed by iron straps into concrete blocks. Six porcelain line insulators are mounted on cast iron pins and bolted to the upright beams. A steel

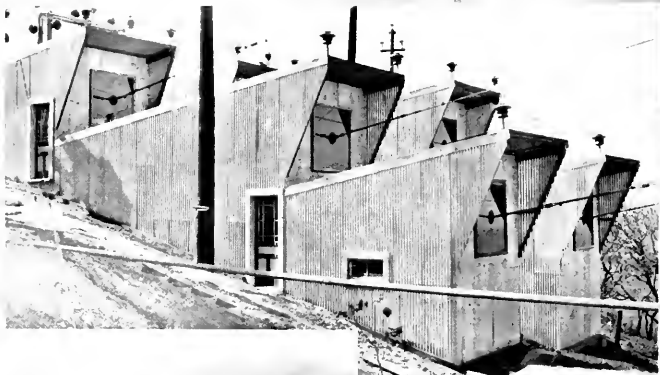


New cable anchors.

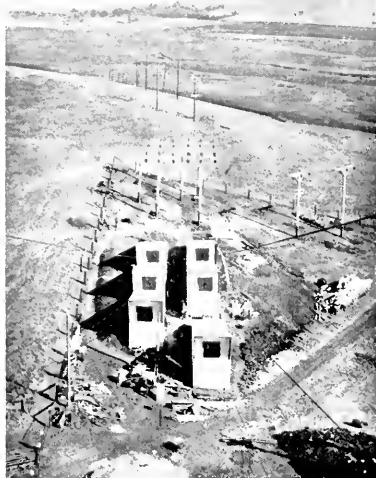
frame-work is bolted to cast iron caps, which are cemented to the tops of the insulators. The cable terminates around an iron sheave which is strapped to a system of springs and beams which is ultimately bolted to the steel frame on the insulators. Each of the six insulators by the above device



Diagrams of cable saddles on the tops of the towers.



Anchor houses, South Tower.



Anchor houses, North Tower.

carries its proportion of the total strain in the cable.

Steel frame buildings, covered with corrugated iron, house the anchors to protect them from the weather. The cables enter these houses through a hole in the center of large plate glass windows or ports.

As a contribution to "Safety First" a somewhat novel scheme has been worked out to safeguard the employee whose duty it is to inspect the saddles and anchors at frequent intervals.

Since it is unsafe to approach these parts while they are "hot," switches have been installed at each end of each set of cables, and by opening these switches power can be taken off one line at a time without interrupting the service. When grounding switches have been closed on the ends of the set of cables from which the power has been taken, then that set of cables is safe to approach for inspection.

To prevent the employee from entering the wrong anchor-house or touching the "hot" set

of cables, doors have been placed on the towers and in the anchor-houses, and are kept locked at all times. The keys are kept in the locks on the grounding switches and are released only when the grounding switches are closed. After the key is turned to lock the switch "in," then it is removed. This key will then

fit the locks on the doors above mentioned, permitting the employee to approach only the set of cables which have been grounded. By the use of the special key in the locks of the doors, as above mentioned, it is expected that the employee will be prevented from forgetting which line has been disconnected from the source of power, and in this



Main Tower on north side of Carquinez Strait.

way it is hoped to prevent accidents.

The main span of the Carquinez cables is 4,427 feet long. It is accredited by the John A. Roeblings Sons Company as the longest of its kind in the world. Surely the man whose business it is to paint these cables every now and then appreciates this length. But, then, with him it is a case of "every man to his trade."

What a 750-Watt Nitrogen Lamp Will Do

By W. S. CLUFF, Solano District

THE effectiveness of illumination afforded by one of the Edison new high efficiency lamps is well shown in the accompanying photo, taken at night, of the store front of Mr. N. M. Bailey's jewelry establishment in Rio Vista.

The lamp is installed in a regular No. 647 copper multiple incandescent fixture, its arrangement being shown in daylight view of store front.

A 12 by 46 in. company sign

is mounted behind the lamp, and its 2½-inch letters are distinctly legible by night from across the 60-foot street.

This installation was made by the company as a publicity feature in Rio Vista, and has attracted considerable attention.

The following clipping is taken from

the December 18, 1914, issue of the "River News," Rio Vista's newspaper:

"The Pacific Gas and Electric Company has installed a 750-watt nitrogen lamp in front of their office at N. M. Bailey's, Mr. Bailey being their local agent. The light is one of Edison's new productions and

gives about twice the lighting power for the size, over the best of other patterns. The lamp installed here is of 1250 candle-power, and throws a bright light for more than a block on each side of the



Before and after lighting the 750-watt lamp.

lamp, making other lights look very dim. According to the figures given us this lamp can be run for about 4 cents per hour. We understand, also, that this style of lamp is still in the experimental stage, and as soon as a method of making them of a smaller candle-power is devised they will become the lamp of the household."

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JOHN A. BRITTON - - - - EDITOR-IN-CHIEF
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A. F. HOCKENBEAMER - - - BUSINESS MANAGER

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VOL. VI. MARCH, 1915. No. 10

EDITORIAL

San Francisco, California, the West, "knew how."

Why?

Because in the make-up of our Western civilization a dominant factor is the spirit of the West, that is the spirit of optimism, the spirit of enterprise, the spirit of "Get up and do." It is the same spirit that the sturdy old pioneers had in them when they set out to brave the hardships and terrors of the trip across the plains, the same spirit that remained in them when they arrived on the Pacific slope to face an uncertain period of unremitting struggle with Dame Fortune, the same spirit that brought them out of that struggle victorious.

It is the same spirit that made our people of San Francisco, of San Jose, of Santa Rosa and other communities that were visited by disaster that memorable day in April, 1906, take the blow without flinching and, turning their resolute faces to the ruins, set about the great work of reconstruction while the ashes were still smoking.

It is the breezy Western life that the breezy Western climate makes possible, no doubt. It does seem as if men of the Western land possess a character quite individual in that they have a capacity

for enjoyment as well as a capacity for work and, being able to blend both in perfect harmony, they enjoy an advantage over the less effervescent peoples of other lands.

After all, perhaps, it is the age and not the race that is making for wonders in the way of achievement. Human nature is pretty much the same all over the world, and the day of success without energy is gone. There have been other disasters since that which fell upon central California not quite nine years ago, and the records show that the afflicted rose superior to their afflictions in every instance. We are learning a world's lesson in man's unflinching determination and heroism every day of our lives right now as we read of the happenings across the seas.

Still, it is well to know that California and, particularly, San Francisco have gained the world's approbation for the achievement that is bringing visitors to the Western metropolis by tens of thousands this glad year of 1915. Our Golden State takes her rightful place as equal in material advancement and in the development of her natural resources to any other State. With her natural advantages of climate and location on the shores of what is to be the greatest commerce-bearing ocean of the future, she should know no backward step from now on. There is nothing she cannot produce; no undertaking, commercial, industrial, agricultural or other, that cannot be prosecuted with substantial success within her confines. This is California's day of opportunity, and the world generally will aid her in making the most of it.

Hail to the Panama-Pacific International Exposition, the wonder Exposition of a wondrous age! And, all honor to the men who brought it about, for their unflinching loyalty to the Western land, their unchangeable belief in its golden destiny, their unselfish devotion to the cause that will bring benefit without end to the generations that are to come!

Ere this number of *PACIFIC SERVICE MAGAZINE* reaches its readers "Pacific Service" Day at the Exposition will have come and gone.

It is unnecessary, of course, to remind our readers that our company furnishes all the gas, electricity and steam used by the Exposition for whatever purpose, and will continue to so furnish until the Exposition has passed into history. Needless to state, also, that in order to insure the best possible service to the Exposition our company has incurred an enormous expense in equipment. It was fitting, then, that in recognition of the important part played by "Pacific Service" the Exposition authorities should set apart a day on which not only members of "Pacific Service" but others interested in its welfare should gather in a body at the Exposition grounds and hold appropriate rites and ceremonies.

It was announced that a commemorative bronze tablet would be presented to the company on this occasion, and around this pleasant ceremony Vice-President and General Manager John A. Britton has arranged a program of exercises to be held in Festival Hall. This, at the time of writing, includes selections on the great organ by Mr. Wallace A. Sabin; the presentation of the bronze tablet by Mr. C. C. Moore, President of the Panama-Pacific Exposition Company; a response in acceptance by our own President, Mr. F. G. Drum; address by Mayor Jas. Rolph, Jr.; addresses on the subject of the great scheme of illumination that has made of the Exposition a perfect wonderland by night by the two engineers mainly responsible for it, Mr. Guy L. Bayley and Mr. W. D. A. Ryan; an address by Mr. H. D. H. Connick, Director of Works of the Exposition, and a discourse by our Mr. Britton upon the subject of hydroelectric development, showing the course taken by the mysterious energy we call electricity from the point of its generation in the mountain power-plants to its delivery at the Expo-

sition grounds. The "Pacific Service" Glee Club will be heard between courses.

It has been arranged that all employees that can be spared from their posts of duty shall be given a special holiday for this occasion. An invitation also has been extended to our stockholders who, we feel, are part and parcel of ourselves. Our Mr. E. C. Jones, chief of the gas department, has been appointed general marshal of the parade and looks like having his hands full, for responses to invitations sent out are arriving in such numbers that "Pacific Service" Day at the Fair promises to be a veritable gala festival. We purpose giving our readers a full description of it in our next month's issue.

Our Stock Sales Department keeps doing a land-office business in our first preferred stock. There seems to be no let-up in the demand for this very attractive investment, and the offices of Treasurer Hockenbeamer and Secretary Foote are being kept busy making out new certificates.

A very sincere compliment to our successful plan of permanent finance was paid the other day by Mr. Cyrus Peirce, head of the local branch of N. W. Halsey & Company, the well known bond-brokers of New York and Chicago. It occurred during the hearing before the State Railroad Commission of the application of the San Joaquin Light and Power Company to be permitted to issue certain bonds. Mr. Peirce was a witness at the hearing and during the course of his examination he was asked if his firm would market an issue of preferred stock by way of substitution for the bonds.

"We do not sell preferred stocks," said Mr. Peirce in reply. "In fact, nobody that I know of is selling preferred stocks just now. The only recent transaction of the kind that I know anything about is the amazing operation carried out by the Pacific Gas and Electric Company and which has excited the wonder of the whole financial world."

The Best Control of Public Utilities

By FRANK G. BAUM

Presented at the joint meeting of San Francisco Section, A. I. E. E., and "Pacific Service" Section, N. E. L. A., San Francisco, Cal., January 22, 1915

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(Concluded from February, 1915)

FIFTH.—There must be some incentive for the company to make economies in construction and operation. To get the best results for the company and the consumer, some plan must ultimately be worked out to make an incentive for the company to reduce the cost of the service. At the present time a company may have an obsolete and inefficient engine plant in operation. This stands on the books at, say, \$50,000. If this unit is replaced by a modern turbine costing, say, \$100,000, the company must wipe off from the books the old engine plant. As a result of the new turbine, the cost of the service is decreased, but generally the effect of this on the company is to have its rates cut. The company has then replaced an old engine by a modern one giving better service, and as a result it has its rates reduced. Of course, this state of affairs does not tend to give the lowest cost of the service, as there is no incentive for the company to improve and reduce the cost of the service. To the credit of most of the large companies it can be said, however, that they have made improvements in spite of this handicap, but the small company generally cannot finance the new improvements.

Again, a community is to be served with electric power. Two plans are feasible, one a local steam turbine plant, the other electric power developed in the mountains and brought to the community by many miles of transmission. The steam power development will cost about one-half the hydroelectric, but the cost of service to the community will be higher if steam power is used. In either case, under present conditions, earnings on the investment are the same percentage. Why, then, go to the mountains and work sev-

eral years acquiring property, making surveys, getting rights-of-way from a thousand or more owners, if the result to the promoting company is only the additional burden of raising the added amount of capital required—and the consumer gets lower rates?

Of course, under the conditions, there will be only a limited amount of water power developed. To make the water power development attractive there must be an allowance made to produce the incentive to make the water power development. This can be done by an allowance for value of water rights or by allowing a higher rate of return on the investment in water power and the electric transmission of this power to the community.

Economy in construction and operation is much more important than ordinarily assumed, and a company able to get these results should be encouraged. A high-class organization is as necessary as a high-class power system in order to give efficient service. The standard of the business must, therefore, be such as to attract high-class men to the service, and the ability of the company to obtain money must be such as to make it the aggressor in making economies and in obtaining new business.

It costs money to get together a high-class organization, and it costs money and energy to keep it together and working efficiently. Different organizations may easily make a difference of twenty-five to seventy-five per cent in the cost of construction, and a difference of five to twenty-five per cent in the cost of operation.

It should also be remembered that economy of financing is one of the important elements in low cost of operation. If, through lack of confidence on the part of

investors, money cannot be had on reasonable terms, the cost of the service must increase.

The relative value of men to society cannot be expressed as any function of their length, breadth and thickness, but their value is a function of the saneness and fertility of their imagination, of the confidence inspired by their honesty and ability, and of the results accomplished by their energy and enthusiasm. Similarly, the value of a utility to a community is not capable of full determination by measurement of physical dimensions of structures and the classification of materials, and the fixing of unit prices, and the use of an adding machine. The highest dam or the largest area of reservoir, the longest canal or the longest transmission, do not necessarily give the best power system. The cost of a thing does not measure its value. The boy who spends most money at college does not get the most education. Cashable ideas are not purchased by the pound or cubic yard.

The value of a system is measured by what it does when compared with some other system, and by what the system does for the general good of the community. And what the system does for the general good depends on the imagination, ability and honesty of those directing the work, and on the ability, confidence and the enthusiasm with which the work is done.

To promote the eagerness and ability on the part of the consumer and the company, which is necessary for the best interests of the business, we see, therefore, that ability, brains, confidence and large experience are necessary, and we cannot get the same results by replacing these with ambition, brag, conceit, and by jumping at conclusions derived from wrong premises and without the test of experience.

All of which, and more, is expressed by the axiom at the beginning of this paper: "The best control of a public utility is that which develops an eagerness and ability on the part of the company to furnish the service, and an equal eagerness and ability on the part of consumer to purchase the service."

CONCLUSION.

It is believed that the success of the electric power business depends upon developing a diversified load. To obtain a diversified load it is necessary to have "class rates," in order that the power business may be developed parallel with the lighting. Class rates, as determined by the method described in this paper, it is believed, are equitable to all consumers and will result in the lowest rates to all consumers as business is developed.

The eagerness and ability which it is desirable to create on the part of the public utility company and the consumer, then, primarily depend upon two things:

(1) Liberal rates of return on investment so that the companies will make developments, extensions and economies.

(2) Class rates determined by the method herein outlined, applied to develop all the possibilities of the business.

Uniform class rates are necessary to build up a diversified business, give the lowest stable rates to all consumers and to form an incentive to the companies to reduce financing, construction and operation costs.

It is believed that the application of the above will result in "an eagerness and ability on the part of the company to furnish the service and an equal eagerness and ability on the part of the consumer to purchase the service," and it is confidently believed that this will result "to the best interests of the business," considering the company, the consumer and the community as a whole. If it does that, as it is confidently believed it will, there will result "the best control of public utilities."

James Hugh Wise Library

The demand for books and magazines during the winter months has been very encouraging. Especially so have the ladies' magazines proved interesting and helpful. Although every thing as yet is on a small scale, subjects on science, religion, history, law, engineering and commerce, etc., may be found on our shelves.

The number of bound volumes at the first of this month was 780, pamphlets 2824.

J. P. B.

“Pacific Service” Reclamation Work in Marin

By CARL A. PHELPS, Line Foreman, Marin District

IN 1911 the California Fruit Canners Association bought the old Ferris Ranch located at Ignacio, Marin County, which at that time, was used as a stock ranch; but as horses and cattle were not the specialty of the new owners they undertook to build a levee on the bay shore on the east and the Novato creek on the north and drain the land with a system of lock-gates.

As the water gained when the tide receded only to three feet, gates were found impracticable, the seepage under the levees being so great that the ground was covered with water half the time. It was then decided to dredge a system of canals and drain the water by mechanical means.

A drive today over the property, which is called the Marin Meadows Ranch, reveals twenty-six hundred acres of good, rich soil under cultivation. To go over the ranch, you first drive about a mile north and east of Ignacio, where you arrive at the home ranch by the only inlet and outlet of the property, as it is almost entirely surrounded by canals. At the home ranch are numerous barns, spacious bunk-houses for the employees, the office and home of Mr. Jongenell, the

superintendent, and on the bank of the slough, almost hidden from view, we find “Pacific Service” working overtime at this time of the year. This pumping station, which we will call “unit No. 2,” numbering the plants in the order in which they were erected, consists of a 3-phase, 440-volt, 150 h. p. motor, driving



Remodeled ditching machine, capacity 500 feet per day.

a 26-inch Jackson centrifugal pump throwing 26,000 gallons of water per minute.

In driving to unit No. 1, located about midway between the home ranch and the bay shore, one crosses numerous canals of two sizes, the larger canals being about 25 feet wide and 5 feet deep and the smaller of a V-shape about two feet



Clam-shell dredger. Capacity, on canal 25'x5' one mile per month.



Another view of clam-shell dredger.



Looking east from Home ranch before reclamation.



System of canals.

wide at the bottom, the canal system being tied together and draining to low points at which the pumps are located.

There are about twenty miles of dredged 25'x5' canals at the present time.

At unit No. 1 on the Novato creek there is a 3-phase, 480-volt, 50 h. p. G. E. motor driving a 20-inch Price pump, discharging 14,000 gallons per minute, this plant being the first "Pacific Service" installation on the ranch. On getting back on the main road, we cross under the Cordelia-San Rafael steel tower H. T. line, which has a right-of-way over the property, and proceed to the bay shore, where unit No. 3 is located. This, the most recent installation, comprises a 3-phase 550-volt, 150 h. p. Westinghouse motor driving a 26-inch Price pump, discharging 35,000 gallons of water per minute into San Pablo bay.

When one stops to consider the total

installation of 350 h. p. operating at once, discharging water at the rate of 75,000 gallons per minute, or 4,500,000 gallons per hour, the magnitude of this reclamation project becomes apparent.



Installing discharge pipe for unit No. 3.

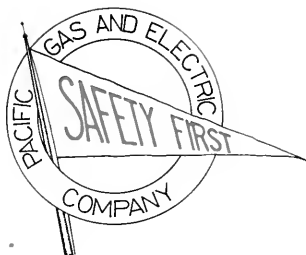
Service is supplied by the company from an 11 K. V. line running out of San Rafael substation, the entire load being metered on the primary side at one central point near the home ranch-house.



Unit No. 2. Capacity 26,000 gallons per minute.



Unit No. 3. Capacity 35,000 gallons per minute.



DON'TS

Lineman of "Pacific Service":

Don't tie yourself to the top of a pole with a weak or defective "safety" belt that is not safe. Examine your belt every morning to see that it is *safe*.

Don't use a hand axe or a hammer with a split or loose handle. You may injure yourself or kill someone. See that the handles are sound and securely wedged in the eyes. Washers and nails won't do for wedges.

Don't allow the public to stand around underneath a workman on a pole. Tools or material may fall. The groundman should warn all persons away, politely telling them of the danger.

Don't forget that there is someone waiting at home for you, expecting you to return whole.

CENTRAL SAFETY COMMITTEE.

Pacific Coast Gas Association

OFFICE: 445 SUTTER STREET
SAN FRANCISCO

TO THE MEMBERS OF THE

March 1, 1915.

PACIFIC COAST GAS ASSOCIATION.

Gentlemen:—All our thoughts and hopes have centered on the magic year 1915, and at last it is here and is full of promise. It is good to be a Californian, and it is a privilege to live in dear old San Francisco and feel the thrills of pride in the wonderful Panama-Pacific Exposition. Opened on time, February 20th, with everything in readiness, it is an Exposition of grandeur, beauty, light and color.

The lighting of the Exposition is a triumph in illumination never before dreamed of, and the wizard who conceived the lighting effects employed sunlight, electricity and gas impartially to produce the marvelous results. There are miles of high pressure gas lamps, and the "Zone" is lighted by gas.

One of the unique features of the Exposition is the Collective Gas Exhibit in the Palace of Manufactures. Within a pavilion covering ten thousand square feet there is a comprehensive exhibit of every branch of the gas industry. This exhibit is entirely lighted by gas, and is an excellent shrine for a gas man to renew his allegiance to gas, and be reassured that gas still holds an important place in the field of illumination. It is hoped and expected that every member of the association when visiting the Exposition will make the Collective Gas Exhibit his headquarters, and avail himself of its many comforts and conveniences.

Our association is the host to the International Gas Congress, which convenes in San Francisco the week beginning Monday, September 27, 1915, and while your committee and the joint committee in the East have labored hard and perfected plans which assure the success of the Congress, we must not forget that as members of the Pacific Coast Gas Association we should contribute in every way to make it a success, and try and make our visitors love California as we love it.

Our annual meeting in September will be a short business session, so that all of our time can be devoted to the reception and entertainment of our guests.

Sincerely,

E. C. JONES, President.

TO THE MEMBERS OF THE

March 1, 1915.

PACIFIC COAST GAS ASSOCIATION.

Gentlemen:—At our Twenty-second Annual Convention Mr. John A. Britton, as chairman of the Gas Congress Committee of the Pacific Coast Gas Association, announced his appointment to serve on that committee all past presidents of the Pacific Coast Gas Association, and in order that you may be fully informed, the personnel of this committee as it exists today is as follows:

MR. JOHN A. BRITTON, Chairman

MR. E. C. JONES

MR. L. P. LOWE

MR. C. S. VANCE

MR. CHAS. F. ADAMS

MR. JOHN MARTIN

MR. GEO. C. HOLBERTON

MR. JOHN CLEMENTS

MR. C. O. G. MILLER

MR. F. A. CRESSEY, JR.

MR. M. C. OSBORN

MR. W. B. CLINE

MR. GEO. H. COLLINS

MR. W. A. ALDRICH

MR. F. A. LEACH, JR.

MR. W. P. HUTCHINSON

MR. WM. BAURHYTE

It may also be opportune at this time to announce that the following members of the Association have been appointed by Mr. Britton to serve on the Committee on Collective Gas Exhibit at the Panama-Pacific International Exposition:

F. A. CRESSEY, JR., Chairman

F. A. LEACH, JR.

C. B. BARCOCK

H. P. FITTS

D. E. KEPPELMANN

B. S. THOMPSON

H. B. BASFORD

PAUL HAUGH

B. S. PEDERSEN

W. B. BOARDMAN

F. C. MILLARD

JOHN B. REDD, Superintendent

Yours very truly,

HENRY BOSTWICK, Secretary.

DOINGS

of "PACIFIC
SERVICE" SECTION

N.E.L.A.

CHRONICLED BY ERNEST B. PRICE

One of the most instructive as well as interesting meetings of the sub-section series was held on Friday evening, February 26th, at National Union Hall, San Francisco, under the auspices of the Hydroelectric Department. The journey of the latent energy of the snowflake from its initial resting place on the rugged mountain peaks of the high Sierras down through varying stages until it found its ultimate expression in the golden glow of a great Exposition, proved of absorbing interest, and the magnitude and efficiency of our vast hydroelectric development stood forth in relief under the skillful treatment of the subject by the various speakers.

Mr. P. M. Downing described the general scheme of power-houses and the network of transmission lines. He pointed out that the topography of the northern section was better suited for the retention of water than the granite formation of the southern country.

Mr. George H. Bragg showed a number of diagrams describing a complete hydroelectric system, the different heads of the power-houses and their relative capacities being shown in comparative form. This was followed by a description of the interiors and exteriors of all the power-houses, the speaker calling our attention to many interesting features, such as the types of governors used and cross-sections of the water wheels. In closing, Mr. Bragg described the Carquinez Straits span, showing the method of anchoring the cables and the installation of the safety guard-gates on the tops of the towers which, by means of an interlocking system of control, eliminate all danger from contact with high-voltage current when it is necessary to do repair work.

At the conclusion of Mr. Bragg's address, Mr. J. L. Gilbert sang, accompanied by Mr. Richard Hunt at the piano, and his two solos were thoroughly enjoyed.

Mr. Downing then presented Mr. E. H. Steele, who traced the history and development of line-construction from the days of wooden pins and insulators up to the all-steel tower and suspension type of insulator. Mr. Steele showed us the method of erecting the towers and also some of the difficulties encountered in the mountain districts, and the type of special towers designed to meet these conditions.

Mr. H. A. Laidlaw gave a series of views showing the various switches used, together with the exteriors and interiors of typical substations on the system. Two interesting voltage charts were shown before and after the introduction of a synchronous condenser on the line as a means of more perfect voltage regulation. The speaker also showed some typical pumping plants of consumers in the irrigation and reclamation districts served by "Pacific Service."

Mr. Fred George, described the load dispatching system and pointed out the necessity of a scheme of centralized control, which backed up by an adequate system of communication and the use of a dummy switchboard, together with a complete system of records relating to loads, line conditions, etc., reduced the chances of interruption to a minimum. Mr. George demonstrated the flexibility of the entire system by means of a cleverly prepared chart on which were shown the various ways of feeding into a trouble zone, and how by manipulating this chart the different sources of supply instantly appeared.

There was a bumper attendance.

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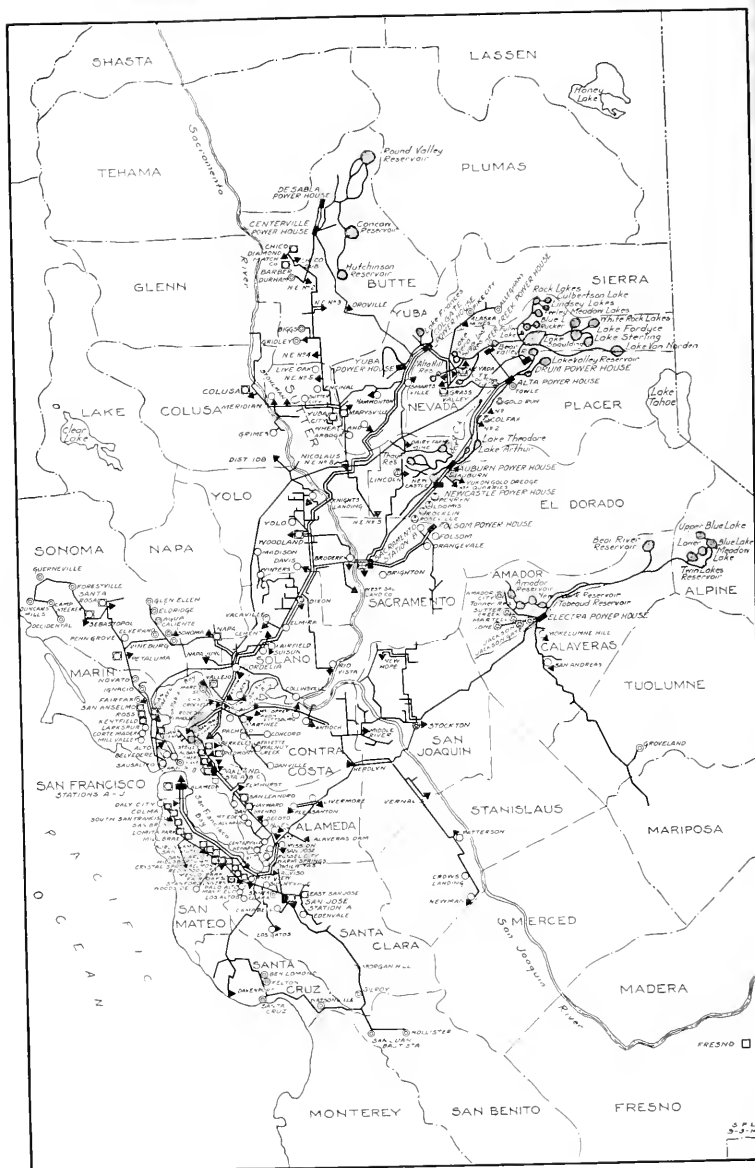
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PACIFIC GAS AND ELECTRIC COMPANY

CITIES AND TOWNS SUPPLIED WITH GAS, ELECTRICITY, WATER AND RAILWAY

SERVICE FURNISHED	NUMBER OF CITIES AND TOWNS SERVED BY COMPANY			TOTAL POPULATION
	DIRECTLY	INDIRECTLY	TOTAL	
Electricity.....	126	49	175	1,221,218
Gas.....	48	2	50	1,125,068
Water (Domestic).....	8	11	19	58,690
Railway.....	1	..	1	75,602

Place	Population	Place	Population	Place	Population
*Alameda.....	27,000	*Gold Run.....	100	*Piedmont.....	1,720
*Albany.....	800	*Grass Valley.....	4,500	*Pike City.....	200
*Amador City.....	200	*Gridley.....	1,800	*Pine.....	1,500
*Alleghany.....	200	*Grimes.....	250	*Pittsburg.....	2,372
*Alviso.....	200	*Groveland.....	125	*Pleasanton.....	2,000
*Angel Island.....	280	*Guerneville.....	500	*Port Costa.....	600
*Atherton.....	250	*Hammonden.....	500	*Redwood City.....	3,200
*Auburn.....	2,375	*Hayward.....	4,000	*Richmond.....	10,000
*Aguia Caliente.....	100	*Hillsborough.....	1,000	*Rio Vista.....	884
Alvarado.....	900	*Hollister.....	3,000	*Rocklin.....	1,000
Antioch.....	3,000	*Ignacio.....	100	*Roseville.....	2,600
Arboga.....	100	*Jone.....	900	*Rodeo.....	500
Barber.....	500	*Irvington.....	1,000	*Ross.....	500
*Belmont.....	350	*Jackson Gate.....	100	*Russell City.....	250
*Ben Lomond.....	800	*Jackson.....	2,035	*Sacramento.....	75,602
Belvedere.....	1,000	*Kentfield.....	250	*San Andreas.....	200
Bentley.....	3,360	*Knights Landing.....	350	*San Anselmo.....	1,500
*Berkeley.....	53,000	*Knightsen.....	125	*San Bruno.....	1,500
*Biggs.....	750	*Lafayette.....	100	*San Carlos.....	1,000
Bollinas.....	200	*Livermore.....	2,250	*San Francisco.....	530,000
Brighton.....	100	*Los Gatos.....	3,000	*San Jose.....	37,946
*Broderick.....	200	*Larkspur.....	600	*San Leandro.....	4,000
*Burlingame.....	4,300	*Lincoln.....	1,400	*San Lorenzo.....	100
*Camp Meeker.....	600	*Loma Park.....	100	*San Mateo.....	6,500
*Cameron.....	1,000	*Los Altos.....	500	*San Quentin.....	2,500
*Centerville.....	13,000	*Loomis.....	400	*San Rafael.....	6,000
*Chico.....	150	*Madison.....	400	*San Pablo.....	1,000
*Collinsville.....	3,500	*Madrone.....	125	*Santa Clara.....	6,000
*Colma.....	1,500	*Martinez.....	5,000	*Santa Cruz.....	10,000
Concord.....	1,500	*Martell.....	150	*Santa Rosa.....	10,500
Cement.....	1,500	*Marysville.....	7,000	*Schastopol.....	1,200
*Colfax.....	500	*Mayfield.....	1,500	*Sausalito.....	2,500
*Cordelia.....	150	*Menlo Park.....	1,500	*Sheridan.....	150
Corte Madera.....	350	*Meridian.....	300	*Smartsville.....	500
Crockett.....	2,500	*Millbrae.....	300	*South San Francisco.....	2,500
*Crow's Landing.....	375	*Millitas.....	300	*Stanford University.....	2,600
*Daily City.....	250	*Mill Valley.....	2,500	*Sonoma.....	1,200
Danville.....	250	*Mission San Jose.....	500	*Stege.....	1,000
Davis.....	750	*Mission Hill.....	150	*Stockton.....	35,000
Decoto.....	350	*Mokelumne Hill.....	150	*Suisun.....	1,200
*Dixon.....	1,000	*Morgan Hill.....	1,000	*Sutter City.....	150
*Davenport.....	1,000	*Mountain View.....	2,500	*Sutter Creek.....	1,500
*Durham.....	500	*Mt. Eden.....	200	*Sunnyvale.....	1,500
*Dutch Flat.....	500	*Nare Island.....	500	*Tiburon.....	400
*Duncan's Mills.....	150	*Napa.....	7,500	*Towle.....	100
*Edenvale.....	500	*Nevada City.....	2,700	*Vacaville.....	1,200
*Elbridge.....	500	*Newark.....	700	*Vallejo.....	13,600
*Elmira.....	500	*Newcastle.....	750	*Vineburg.....	200
*El Verano.....	150	*Newman.....	1,000	*Walnut Creek.....	350
*Emeryville.....	400	*Niles.....	800	*Warm Springs.....	200
*Encinal.....	5,000	*Novato.....	250	*Watsonville.....	3,500
*Fairfax.....	100	*Oakland.....	215,000	*Wheatland.....	1,400
*Fairfield.....	500	*Oakland.....	400	*Winters.....	1,200
*Forestville.....	834	*Orange Vale.....	100	*Woodland.....	5,500
*Felton.....	100	*Palo Alto.....	6,300	*Woodside.....	200
*Fresno.....	300	*Pacifica.....	200	*Yolo.....	400
*Folsom.....	40,000	*Palo Alto.....	250	*Yuba City.....	1,200
*Gilroy.....	1,800	*Patterson.....	300		
*Glen Ellen.....	2,000	*Penn Grove.....	300		
	500	*Petaluma.....	5,500		
				Total.....	1,288,218

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When writing, please mention PACIFIC SERVICE MAGAZINE



PACIFIC SERVICE MAGAZINE



THE COURT OF ABUNDANCE, PANAMA-PACIFIC INTERNATIONAL EXPOSITION

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6

APRIL • 1915

No.
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VOL. VI



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Contents for April

"WELCOME!" CRIED JOHN A. BRITTON	Frontispiece
"PACIFIC SERVICE DAY" AT THE EXPOSITION	F. S. Myrtle . . . 363
WATER FUEL	H. C. Vensano . . . 372
PURCHASING DEPARTMENT STILL KEEPS BUSY	377
THE FINANCIAL SIDE OF "PACIFIC SERVICE"	A. F. H. . . . 378
OF PERSONAL INTEREST TO OUR MEMBERS	382
DOINGS OF "PACIFIC SERVICE" SECTION, N. E. L. A.	E. B. Price . . . 383
VIEWS OF THE CROWD ON "PACIFIC SERVICE DAY"	384-5
SAFETY FIRST!	386
MOOSWOOD PARK, OAKLAND—"PACIFIC SERVICE" LIGHTS THE FIRST LARGE PUBLIC PLAYGROUND OPEN FOR NIGHT USE	387
EDITORIAL	388
SPORADIC INSULATOR TROUBLES—PAPER READ BEFORE SAN FRANCISCO SECTION, A. I. E. E.	P. M. Downing . . . 390
FIRE PREVENTION—WARNING!	R. J. C. . . . 393
TIDINGS FROM TERRITORIAL DISTRICTS	394

Index to Advertisers

Allis Chalmers Mfg. Co	ii	Pierson, Breeding & Co	v
Associated Oil Co	iii	Ruedling's, John A., Sons Co	vi
Bonbright, William P. & Co	i	Schaw-Butcher Co	vii
Byron Jackson Iron Works	iv	Sprague Meter Co	iii
Chaplin-Fulton Mfg. Co	vi	Standard Underground Cable Co	vi
General Electric Co	viii	Steiger & Kerr Stove & Foundry Co	v
General Gas Light Co	ii	Wagner Electric	vi
Halsey, N. W. & Co	11th page cover	Westinghouse Electric & Mfg. Co	ix
Johns-Manville, H. W., Co	iv	Welsbach Company	iii
Pacific Telephone & Telegraph Co	2nd page cover	White, J. G., Engineering Corporation	2nd page cover
Patrick & Co	vii	Wood, R. D. & Co	ix
Pelton Water Wheel Co	vii		



Washington, D.C. - A group of people gathered around a large table in a grand hall, possibly for a formal event or ceremony.

"Pacific Service Day" at the Exposition

By FREDERICK S. MYRTLE

PACIFIC Service Day" at the Panama-Pacific Exposition—Monday, March 15, 1915.

Both the event and the day will live in the memory for long years to come.

It was certainly an event to be remembered, for it marked an epoch in the life's history of our great organization.

"Think of it!" cried President C. C. Moore of the Exposition company. "We are here to do honor to a California corporation!"

As he spoke his smiling gaze took in a concourse of people which radiated from the bandstand to the broad avenues beyond. And five thousand throats voiced their approval of the sentiment conveyed by his words.

Truly an epoch-marking event, for it revealed the establishment of a new order of things in our Western community, the drawing together in bonds of amity and understanding of a public service corporation and the public it serves.

Stockholders and consumers walked with members of "Pacific Service" on that day of days, took part in the joyous parade and swelled the throng at the exercises. It was one comprehensive celebration that knew no distinction of rank, of class, of service or patronage. As a great San Francisco daily put it the next morning:

"The largest family in the State of California took possession of the Panama-Pacific Exposition yesterday."

"Pacific Service" played in its usual good luck in more ways than one. The weather-god was most gracious, for he rose betimes and so smiled upon the scene that by the hour set for the opening all nature was clad in holiday garb in keeping with the occasion. And, from

the moment when Grand Marshal E. C. Jones sounded the advance to that when the Exposition gates closed behind the last lingerer, there was not a cloud upon the perfect day, nor upon the perfect evening which followed.

It was truly a great outpouring. That it would be so was forecast in our last month's issue; but that it exceeded the best estimates of those in charge was shown when Vice-President and General Manager John A. Britton found himself compelled to abandon the original idea of holding the exercises in Festival Hall and moved the scene over to the Musical Concourse, where the open-air capacity is almost unlimited. Apologies were due Mr. Wallace A. Sabin, who had promised to favor us with selections on the great organ, but there was no help for it. Festival Hall was too small by half for the crowd that did honor to "Pacific Service" that day.

Everything was carried out with clockwork precision. Our Mr. E. C. Jones worked like a Trojan on the parade, drawing plans for the assembling of the various divisions at various points, lining up his aids, doing all that a grand marshal should and then some. The result was that when five thousand persons, by actual count, passed in through the Fillmore street entrance six abreast they presented all the appearance of a well-drilled little army; and they kept in line the entire way through the Exposition grounds to the scene of the exercises.

The parade was formed in four main divisions, the first of which fell into line on Lombard Street, east of Fillmore. In this were President Drum, officers and directors of "Pacific Service," stockholders and specially invited guests, among



Bird's-eye view of the Panama-Pacific Exposition from the Presidio hills.

these latter the mayors of most of the interior cities and towns in the company's territory; then came heads and members of departments. The second main division formed on Webster street, north of Lombard, and was made up of all the out-of-town districts with the exception of Alameda County District: twenty-five districts in all, stretching from Chico down to Fresno. Alameda County, upwards of twelve hundred strong, formed the third main division on Webster street south of Lombard, while the fourth main division, gathered on Lombard street, east of Webster, consisted of San Francisco District, numbering upwards of two thousand. Engineer Paul M. Downing of the O. and M. Department, Hydro-Electric Section, was marshal's aid in charge of the first main division; Ralph Elsmann of the Electric Distribution Department and Sherwood Grover and W. M. Henderson of the Gas Department took charge of the second, while Frank A. Leach, Jr., captained his own Alameda County contingent, and G. C. Holberton that from the metropolis. Charles L. Barrett chaperoned a contingent of veterans, mostly retired employees of the various subsidiary corporations combined in "Pacific Service."

It was a pleasant sight to observe so many members of the fair sex in the throng. The invitation sent out by Mr. Britton included the families of all employees, and these, with a goodly turnout

of women employees and not a few individual women stockholders, made a brave showing. Needless to say they contributed greatly to the general color scheme, as did, also, the "Pacific Service" badges with which every person was decorated. This consisted of the "Pacific Service" emblem supported by three ribbons, a blue ribbon bearing the word "gas," a golden ribbon inscribed "electric," while a white ribbon bore the blue-lettered legend "Pacific Service Day, Panama-Pacific International Exposition, March 15, 1915." Besides, a special souvenir of the occasion was handed round. This consisted of an ornamental book, with selected views of our system in colors and a list of "facts to be remembered," which will be found elsewhere in this number.

It was a good-looking as well as a joyous gathering and, as I have said, it numbered just five thousand persons.

Precisely at the stroke of ten, Grand Marshal Jones, accompanied by Chief of Police White and Lieutenant Rose of the United States army, placed himself at the head of the procession and the start was made down Fillmore street. A drum corps led to the entrance gate, where a party of Exposition officials, accompanied by an escort of Exposition guards and Cassassa's band, gave welcome. Special admissions had been purchased for the occasion by the company's management, so that there was no halt at the

turnstiles and the entire procession passed through the gates six abreast and kept time to the martial music of the band. The way led down the Avenue of Progress to the Avenue of Palms and on to the Musical Concourse. As the San Francisco contingent entered the grounds the Philippine Constabulary band fell into line at the head of this division and furnished music for the tail end of the parade. It may be said of the parade that it stretched the entire length of the Exposition grounds from the entrance gate to Musical Concourse, a stretch of six city blocks.

Passing Festival Hall Mayor James Rolph Jr. of San Francisco joined the procession. On arrival at the scene of the exercises President C. C. Moore of the Exposition, accompanied by his naval aid, Lieutenant-Commander Clark Woodward, met the party and cordial greetings were exchanged. Among the Exposition officials who marched in the parade were Captain Asher Baker, U. S. N., Messrs. H.

D. H. Connick, Theo. Hardee, Guy L. Bayley, W. D. 'A. Ryan, Colvin B. Brown. These all took seats on the bandstand, as did also the officials and directors of our company and the members of "Pacific Service" glee club who were to participate in the program of exercises.

Mayor Rolph sat with Presidents Moore and Drum and Mr. Britton in the front row. Some of the mayors from the interior occupied seats on the bandstand, while others preferred to distribute themselves among the audience. The list of those who accepted the company's invitation included the chief magistrates of Oakland, Alameda, Piedmont, Pleasanton, Emeryville, Livermore, Richmond, San Leandro, Grass Valley, Marysville, Nevada City, Santa Rosa, Sebastopol, Petaluma, Newman, Crows Landing, Patterson, Concord, Benicia, Martinez, Antioch, Pittsburg, Walnut Creek, South San Francisco, Mayfield, Hillsborough, San Mateo, San Jose, Santa Clara, Sunnyvale, Colusa, Albany.



The procession down the Avenue of Palms on its way to the Musical Concourse.



All wore smiles, notably Messrs. Britton, Moore and Drum.

The exercises opened with a selection from Cassassa's band. Then Mr. Britton rose and, standing over the "Pacific Service" emblem in the center of the bandstand, stretched out his arms in welcome. Needless to say there was loud cheering. Everybody was glad around there. The officials in the bandstand vied with the men and women in the audience in broad and undisguised smiles, and Mr. Britton's was perhaps the broadest of them all. In his usual happy manner he welcomed all before him to "this great family gathering." He complimented the men and women of "Pacific Service" on their wonderful turnout and paid his respects to the weather-god who had expressed his approval of the celebration by giving it "Pacific Service" weather. Mr. Britton then introduced President Moore of the Exposition, saying of him:

"Without his indomitable will and en-

ergy I doubt very much if the Exposition would have been ready and in the shape we see it today."

Mr. Moore opened his address right happily. He said, "Ladies and gentlemen, we are all wearing badges this morning. It is a corporation badge. It is a badge of honor, and I am delighted and proud to have it on my coat this day." Needless to say the entire audience voiced its approval. Then the Exposition president went on to talk of the changes in times and, with them, the changes in the corporations and in the feeling of the public toward the corporations. I quote from Mr. Moore's address:

"What a corporation is this! You are proud of it; I am proud of it, the whole State is proud of this splendid corporation here this morning. I cannot express to you the feeling I had as I saw the great crowd brought in here together. This

meeting this morning has an unusual purpose. Think of it! To honor a California corporation! And well may we be proud to do this honor, when we stop to think what this corporation has done for us. Unusual it is, but well they deserve that honor. This great outpouring of people here this morning, in response to the Exposition's earnest desire to give recognition to the great forces which have been at work for the betterment of the Exposition and the benefit of us all, is not altogether accounted for in that desire; I want to digress for a moment to say that in my humble opinion this enormous attendance is a personal tribute made to Mr. Drum and Mr. Britton.

"No one knows better than the Exposition management that all this great work here could never have been accomplished by any one man or thing, but that it is all due to many forces at work, to individual members of a great force, and it has always been our plan and aim and

we are glad to recognize the forces which are responsible for the Exposition as it stands today. This is the second corporation that has been recognized. We are under obligation to the corporation for the services of our Director, John A. Britton, and yet we do not want to credit the corporation over greatly for that service in his behalf, for we learned that, aside from the corporation's part, Mr. Britton would want to aid personally as far as lay in his power.

"There are other credits, of course, but the greatest things we are indebted to this great corporation for are, first, the tremendous creation of the illuminating works here, and, second, their light contributions, running into vast sums of money, and that assistance beyond money that they gave us when it came to planning the lighting of the Exposition. Of the work of this corporation I can never, speaking of the Exposition, properly express our appreciation, nor of the earnest-



Some idea of the crowd that gathered to do honor to "Pacific Service."



President Drum receiving the bronze plaque at the hands of President Moore.

ness, enthusiasm and thorough co-operation rendered which has made possible that lighting picture you see here at night.

"It would seem, for what this company has done, that it is most proper and fitting that it should receive from the Exposition some token of its helpfulness, earnestness and co-operation, and on behalf of all public-spirited people I express to this company and to its officers and all those connected with it our thanks and appreciation, and we should always take the greatest pride in the part that they have played in this Exposition-building business. I believe that when the people at large understand how closely connected with all the public affairs our corporations are, they will come forward to do their part towards coming to a better understanding between the corporations and the people."

When Mr. Moore called upon Mr. Drum to come forward and receive the bronze plaque that had been prepared by the Exposition company to commemorate the

day and occasion, our president obeyed the summons somewhat bashfully but with evident good-nature. When the bronze plaque had been placed in his hands, as Mr. Moore stated, "in recognition and acknowledgment on our part of what you and your great corporation have done to aid us in our work here," Mr. Drum made response in a very few simple words. He said:

"On behalf of the company I thank you, Mr. Moore, and all your associates for this public recognition. I thank all the ladies and gentlemen present, as one family of loyalty and co-operation, for what they have done and the part they have taken. We hope that in the future we will always merit the confidence and respect that you have reposed in us, Mr. President. I thank you."

"I Love You, California," was next in order. The song which is at present provoking such a storm among musicians of the State as well as the solons in Sacramento was appropriately rendered, Mr.

Clarence Oliver doing the solo part and the members of Pacific Service Glee Club taking up the refrain.

Mr. Britton next announced that Governor Johnson, unavoidably prevented by his official duties from personally participating in the celebration, conveyed his congratulations and good wishes. Following this Mayor Rolph was introduced.

Mayor Rolph has a genial way of expressing things, and he made a hit when he said that "Pacific Service Day" to him indicated a case of "Tramp, tramp, tramp, the boys are marching," also, "Follow the leader." He paid a glowing tribute to our Mr. Britton's handling of our great organization. I think I may be pardoned for quoting:

"It takes big men to handle big affairs; and when you think of the snows on the high Sierras that fall and melt and their waters that flow down the sides of the mountains and into creeks and on to where they are impounded and by and by brought by many lines and ramifications in the form of electrical power into thirty different counties of this State and here into San Francisco, and that this electric power has done so much for the uplifting and development of our State

and our city, I am here to pay your respects and ours to these men who have done these big things that mean so much for all of us.

"If the theory that corporations have no souls was ever exploded it is evident that it is exploded today by the treatment that the men and women of 'Pacific Service' must have received at the hands of the men at the head of this corporation; and this outpouring is indicative of that fact and explodes that old idea."

San Francisco's mayor spoke for a fair deal and for harmony, in place of discord, between the public service corporation and the public. He spoke in praise of our company's part in the illumination of the Exposition. He closed by extending San Francisco's greetings to "the men who are doing so much and, particularly, those who are representing the Pacific Gas and Electric Company."

Next on the program was Mr. Guy L. Bayley, chief mechanical and electrical engineer in the service of the Exposition. He was introduced by Mr. Britton as one of the "old boys" of "Pacific Service" who had wandered away from the fold. Mr. Bayley gave his audience some idea of what it meant for an Exposition like



Inscription on the bronze plaque presented to "Pacific Service."

ours to contract with one corporation for all the electricity and gas service to be consumed by it.

Mr. Bayley told of the large quantity of gas and electrical apparatus loaned by "Pacific Service" to the Exposition and which had enabled the placing of proper equipment for distribution throughout the Exposition grounds. He gave credit also to the Welsbach Company for its high-pressure gas lighting system, in the cost of installing which the company had split even with the Exposition. In a final word of congratulation Mr. Bayley said:

"At the time we were considering making this contract with the Pacific Gas and Electric Company those versed in the history of previous expositions told us it was a dangerous proceeding, for the companies always fell down; that at the St. Louis Exposition, after entering into the contract, the Exposition had to build a 30,000 horsepower plant and finally sold power back to the company. But here we had so much confidence in 'Pacific Service' that we stood out and made the contract.

"We have had all and a great deal more than could have been expected by anybody, and not only that, every possible help that could be rendered at any time by this company. It has never been found wanting; it has been of untold aid to us at the Exposition in many ways entirely outside of the things I have tried to mention. It has been with us heart and soul at all times."

So many nice things were said of Mr. Britton by this speaker and those who had preceded him that our General Manager felt a trifle embarrassed. He passed it off by a pun on his name. "It seems to me you are discussing the war question and there is too much 'Britain' about this. I respectfully request to the coming speakers that they be neutral." Then he introduced Mr. Ryan, the wizard chief of illumination. He, like the others, paid tribute to "Pacific Service."

"I was not as enthusiastic as I might have been till I heard that 'Pacific Serv-

ice' was to be behind my plan of illumination," he said.

Mr. Ryan, however, disclaimed being the whole show in the illuminating feature. "What you admire is the tail of the tree," he said, "its roots are underground. I made the tail, but Mr. Bayley made the tree." He closed a brief address with a statement that his work in San Francisco was the pleasantest he had ever undertaken.

Mr. H. D. H. Connick, Director of Works of the Exposition, under whose personal direction all the giant work of construction had been accomplished, came on last of the Exposition officials. Modestly he deprecated Mr. Britton's introduction of him as a "human dynamo" that had transformed salt marshes into buildings, statuary, electrical illuminations, and what not.

"As a matter of fact," he said, "all that I did was to cut a big job into a number of small pieces. Then, with the assistance of hundreds of others I finally got through with the big job." Speaking of the Exposition Mr. Connick described it as one of the greatest educational institutions on earth. "Where else would you find an educational institution able to address and instruct 50,000 souls every day?" he asked. He spoke of the samples of architecture, of the handiwork of man, of the unusual side of things, of the many congresses to be held in San Francisco during the Exposition year in the proceedings of which will be recorded the progress of man up to the present. Five hundred congresses are already on the schedule, to bring to San Francisco over one million people; out of all this, Mr. Connick thought, will come a better education, a better citizenship, and, as a result, more joy and comfort in life generally.

The "Pacific Service" Glee Club obliged again, this time with "To Thee, O Country!" and then Mr. Britton closed the program of exercises with an address upon the subject dearest to his heart. He told of the wonderful gas and electric exhibits

that visitors to the Exposition should not miss, mentioning, in particular, the Collective Gas Exhibit and the "Home Electrical" in the Palace of Manufactures, the Pelton Water Wheel and the Crane Company exhibits in the Palace of Machinery and that of the United States Steel Products Company in the Mines Building. At this point Mr. Britton thought proper to correct any erroneous impressions that might be in the minds of his audience concerning electricity as "the whole show" in lighting or industrial power-work, or, indeed, as the supplanter of gas to any considerable extent in any direction of enterprise.

"Gas has kept pace with electricity right along," said our chief emphatically. "Moreover, there is more money invested in the United States today in gas plants than in electricity." He gave his audience an idea of the process of gas manufacture, and this, of course, afforded him an opportunity to make a humorous reference to "that infallible, truthful and unerring instrument, the gas-meter." The audience "rose," of course. Proceeding to sketch the history of electricity, Mr. Britton told of what had been accomplished in water-power development and the long-distance transmission of electric energy, and he did not fail to remind his audience that "Pacific Service" was the pioneer of this last-named achievement in the direction of power-development, where the electric "juice" generated in the power-house at 2300 volts can be "stepped" up as high as 110,000 volts, shot with this force over hundreds of miles of high-tension wires and then, at the end of its journey, dropped at will to the humble voltage of 110 for household purposes.

Mr. Britton briefly described the great system by which "Pacific Service" is able to render continuous service to two-thirds of California's population over a territory taking in thirty counties of the State. But he claimed for our company no favors to which it is not entitled by law and justice.

"We claim consideration for our large investment and for our large part in the development of the State," he said. "But we ask no more than an even deal. We want only what we are entitled to, but we do want that and we mean to get it if we can."

It was just about noon when the exercises came to a close. The occasion was voted the most successful of all successful celebrations, and rightly so. All who participated were glad they had the opportunity to do so. When our chief bade his followers run and play the rest of that joyous day and as far into the night as they might please to do, he was obeyed right promptly. Men and women of "Pacific Service" wandered over the grounds. They visited the exhibits that most interested them. Here, again, our Mr. E. C. Jones gave proof of his up-to-date qualities, for he had an orchestra specially engaged from the National Opera Company, then filling an engagement in the city, play outside the Collective Gas Exhibit all afternoon.

In the evening the Exposition management gave further testimony of its feeling of friendship to "Pacific Service." It was not the regular night for the illumination of the grounds, nevertheless, not only were they illuminated but on a scale never before attempted. New colors, new effects were designed and, to crown all, on the north end of the Court of the Universe facing the waterfront there was thrown into the sky a set piece, our "Pacific Service" emblem in brilliant colors, with the legend "Pacific Service, welcome" in bold relief.

Such was "Pacific Service" day at the Panama-Pacific Exposition. It has been suggested that March 17th hereafter be "Pacific Service Day" in each and every year. There will be no Panama-Pacific Exposition, of course, but that need not matter. We may meet and make a holiday just the same, at whatever place chance or design shall appoint, with ourselves and the organization we love so dearly a sufficient, if the sole, excuse.

Water Fuel

By H. C. VENSANO, Civil Engineer

WE all use the term "oil fuel," or "fuel oil," but how many of us use the term "water fuel" or even consider water as "fuel"? Yet, all of us of the Pacific Gas and Electric Company certainly should have this term in mind, as water is the fuel employed in the manufacture and generation of the bulk of our electric power.

If any of us should see the valve of a fuel oil tank open and the oil running to waste, or any considerable leak, we would immediately do our best to stop it, or, at least, to notify its owner. Do we all feel the same way towards a water supply? Do we feel the same way if we see a small stream flowing from a ditch or a reservoir?

As a matter of general interest a few words in this connection might not be amiss.

In fixing our power rates we must definitely fix the value of our water fuel. So that, just as oil has a definite market value at any time and place so has water when used for power purposes. Just as the price of oil varies with the point of delivery, so does the price or value of our water fuel likewise vary. Fuel oil may have a greater value at San Fran-

cisco than at Kern City, and, likewise, our water may be more valuable to us at Electra than at Folsom or Deer Creek. This because of the greater or less difference in elevation through which it may be dropped at any particular power station.

Furthermore, the value of our water fuel will vary all the way in its progress through any individual plant. It is worth less at the storage reservoir than at the power-house nozzle, for the reason that we may have to turn in two second feet at the reservoir in order to receive one second foot at the power-house, due to various seepage, evaporation and other losses which occur in its passage through the system. Under such conditions one second foot at the power-house would be worth as much as two second feet at the reservoir.

In a recent decision of the Railroad Commission (Antioch rate case) an average value was fixed by that body for hydroelectric power at \$0.00488 per K.W. hour at our generating stations. I say value rather than cost, as this figure includes the 8 per cent which they have allowed as a return on the company's investment. Deducting the allowances



Lake Fordyce, the parent reservoir of the South Yuba water system, owned and operated by "Pacific Service."

made for depreciation, maintenance, operation and other general expenses, the above figure represents approximately .00296 per K. W. hour as making up the 8 per cent investment return.

For a "going plant" this represents the value of the water used (when converted from kilowatts to water units). Every second foot loss of water will represent a loss of .003 per K. W. in net return for its corresponding equivalent in power. Using this figure as a basis for placing a value upon water and assuming an imaginary hydroelectric plant having a 1000-foot available drop, I have drawn up as a matter of interest the accompanying table giving the value of water at different points through this plant.

TABLE I.

Assumed Efficiency	Point at which Value is taken	Value of Water per c. f. s. per hr.	Value of Water per sec. ft. per yr.
Reservoir 97%	In Reservoir.....	\$0.1543	\$1350.00
Canal .....90%	At Reservoir outlet.....	0.1590	1390.00
Forebay 99%	At Forebay inlet.....	0.1767	1545.00
Penstock 100%	At entrance to Penstock.....	0.1785	1560.00
Power-House 70%	At Power-House nozzle.....	0.1785	1560.00
(Giving 59.5 K.W. per c.f.s. after conversion to electric power.....)		.003	perk.w.hr.

NOTE.—The partial plant efficiencies assumed represent the efficiency as regards loss of water and are not the true engineering efficiencies used for designing purposes.

The difference between 100 per cent and the efficiency shown in this table represents the loss of water in that particular portion of the plant, except in the case of the power-houses where it represents power-house efficiency in transforming potential water power into kilowatts of electric power. It will be seen that on this basis the lowest value of water, which is that at the reservoir, is 5.7 mills per 1000 gallons, a very finite and definite figure equivalent to \$1350 per second foot for one year. A loss from our reservoir or canal in this particular case would represent \$1350 annually or, if capitalized at 9 per cent, would mean that we might expend \$15,000 to permanently prevent one second foot of leakage. Of course, this figure will vary with the value of our water fuel which

will change from time to time as well as from place to place, just as does the value of oil fuel. (Such figures do not include any value of water rights, which were not considered in the rate case cited, and which will give to our water fuel a still further or additional increment of worth.) It can thus be seen how important a matter is the conservation of our water fuel.

There are, of course, various sources of loss of water in the operation of hydroelectric properties besides the elemental physical leak. Chief of these are:

1. Evaporation and seepage from canals and reservoirs.
2. Limited storage and, therefore, loss of a portion of the flood waters.
3. Loss of stored water at the end of the dry season due to the fact that some storage has not been withdrawn when the new inflow begins.

These facts are thoroughly recognized and understood by the operating men, and for a designing or construction engineer to discuss such questions before our operating readers is, perhaps, laying oneself open to exposure of ignorance. In face of such risk, however, I am going to call attention to a method which may be used in lessening or eliminating the last mentioned source of loss. This method is one which is probably more directly brought to the notice of the designer than to the operator, and I call attention to it in the hope that it may be of some interest. (For the benefit of the rest of us I would suggest that the editor request some engineer in the Operating Department with a little spare time, if there be such, to write a description of the methods used in reducing losses of both water and power to a minimum, as I believe such a paper would be of considerable interest to all of us.)

Considering, then, the loss due to unused storage, it is no doubt recognized by all our readers that it is seldom or ever that a storage reservoir is completely emptied at the end of a dry season. The reason for this is, of course,

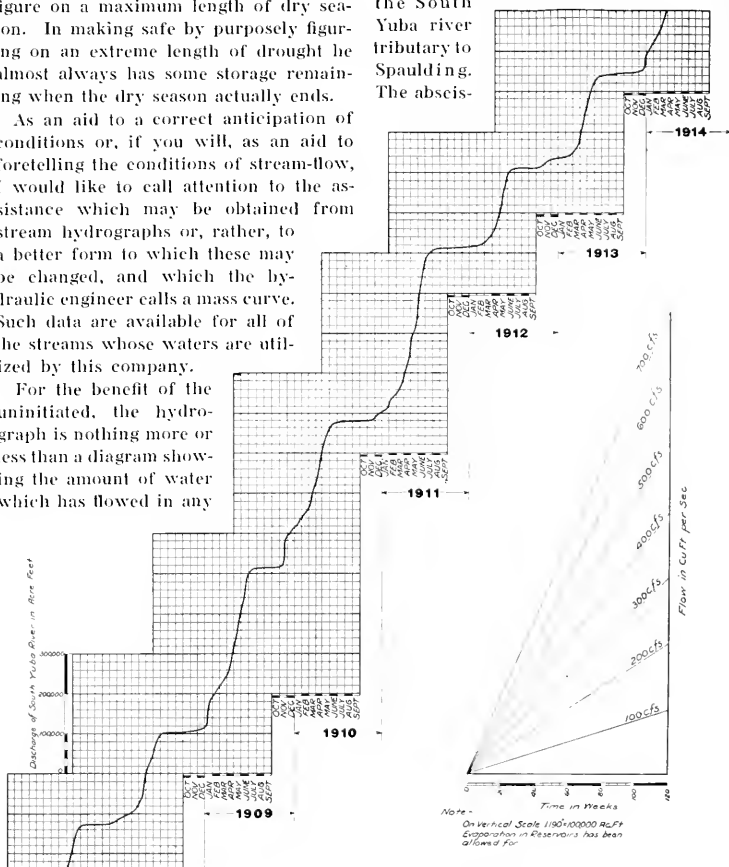
that the operator cannot prophesy the exact time of the beginning of high water in the stream controlled. If he could, he would draw on storage so as to just empty the reservoir at the time the new inflow started. Because of his inability to foresee exact conditions and because of the fact that he must have some water at hand at all times to provide for peak requirements and for domestic purposes in the portions of our system where water is furnished for such use, he must figure on a maximum length of dry season. In making safe by purposely figuring on an extreme length of drought he almost always has some storage remaining when the dry season actually ends.

As an aid to a correct anticipation of conditions or, if you will, as an aid to foretelling the conditions of stream-flow, I would like to call attention to the assistance which may be obtained from stream hydrographs or, rather, to a better form to which these may be changed, and which the hydraulic engineer calls a mass curve. Such data are available for all of the streams whose waters are utilized by this company.

For the benefit of the uninitiated, the hydrograph is nothing more or less than a diagram showing the amount of water which has flowed in any

given stream at any time of the year. To be of benefit for the suggested purposes the record must extend over a considerable number of years. The mass curve is made up from such a hydrograph and represents the amount of water which would have been impounded in a reservoir of unlimited extent if such reservoir had existed at the beginning of the period of record, and if no loss from seepage or other cause had occurred.

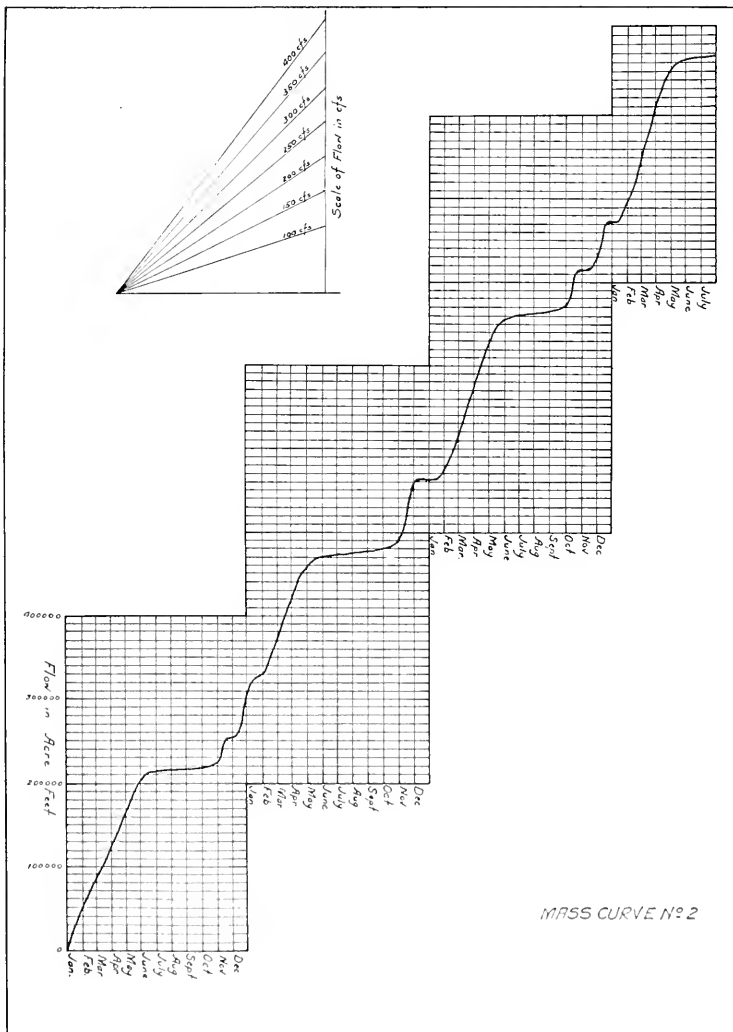
Figure No. 1 gives such a mass curve of the South Yuba river tributary to Spaulding. The abscis-



Mass curve of South Yuba river at Spaulding dam.

sas of this diagram give the time and the ordinates the total number of acre feet of water which would have collected in such imaginary reservoir of unlimited extent. The valuable property of such

curve is that the tangent to the curve at any point may be taken to represent the rate of inflow from the river or the quantity of water actually flowing in the stream at the time in question.





Lake Spaulding affords a practical illustration of "water fuel."

To the right of the diagram have been shown various slope lines representing definite rates of flow. By comparing the tangent at the point in question to such lines, flow in the stream can be readily ascertained for any time.

Now then as to the manner in which a study of such mass diagram may help us. We see from the South Yuba diagram that after each dry season indicated by the horizontal (or nearly so) portions of the curve, there occurs a gradual increase of slope which represents a gradual increase of flow, and this increase in each year of record has been practically continuous, increasing rather rapidly and never again falling off until the next summer or dry season. In comparison to this I will call attention to the mass curve No. 2 which is drawn for an imaginary stream. A study of this will show that at the end of the main dry season the slope rises for a period, then flattens out again for a week or two, again rises, again flattens out, etc., showing that the stream is more or less torrential in character and that even after considerable flow begins at the beginning of the winter season it may again fall off to little or nothing for short periods as indicated by the flat spots in our curve.

Now then, as an example of practical use let us consider the water requirements of our Drum district. This district requires an absolute minimum of about 50 c. f. s. of water at any time of

the year. This water is used in Nevada County for water power (not for the generation of hydroelectric power but power used by the mines) and for domestic purposes. This minimum, then, the District Manager must provide for at all times of the year and must hold sufficient storage to take care of such requirement over any dry season, no matter how extended. In other words, it becomes the incentive, through fear of shortage, to hold excess storage at all times.

The maximum of use in this district is only limited by the capacity of the Drum power-house and its canal system and may range from 350 to 400 second feet.

We have seen from a study of the mass curve that in all years there has been a gradual increase in flow at the end of the dry season from nothing to a maximum without any dropping off after such inflow has started. As the minimum requirement is about 50 second feet, the reservoir, of course, cannot be emptied until such time as the inflow equals this amount. But from a study of the curve we may convince ourselves that after the flow once reaches this amount, or, say, in order to introduce a safety factor, after it reaches 100 second feet it will be safe to empty our reservoir without danger of shortage of supply. This can be done by pulling a load on the power-station such as will require more than 100 second feet in the canal say,

for example, 175 c. f. s. This will take all the inflow into the reservoir and will draw out an additional 75 second feet. We will then finally have an empty reservoir at a time when it is safe to be so, and at no time will we have taken any material chances on lack of supply.

In this manner some real money has been earned, in that 75 second feet has been withdrawn for such period as the remaining water in the reservoir would supply it over and above the inflow to the reservoir.

As before stated this method should only be used where records for a period of years are available and after a careful study has been made of the mass curve for the particular system under consideration, in order to be sure that a condition as shown in mass curve No. 2 will not occur.

The mass curve of a stream having

characteristics as No. 2 is of less assistance, but from a similar study we may find that when the inflow reaches a definite amount only short low-flow periods will occur thereafter, and from a study of the length of such dropping periods we may be able to judge how much storage as a minimum should be retained. In other words, instead of emptying the reservoir entirely we can, on finding that the longest dry spell is a month, empty the reservoir to such points as it will just supply the requirements of one month.

In conclusion, the question of the value of water is one which is coming more and more to the attention of engineers, operators and rate makers, and this paper is written in the hope that it may produce some discussion in these columns which will be of interest and benefit to all.

Purchasing Department Still Busy

Following are a few of the larger contracts recently placed through the Purchasing Department:

Contract with Chas. C. Moore & Company, covering the purchase of a Feed Water Heater for Station "B," Oakland, Cal.

Contract with the International Steam Pump Company, covering the purchase of a 26½x30-inch Laidlaw-Dunn-Gordon Compressor for Metropolitan Gas Works, San Francisco, Cal.

Contract with the Judson Manufacturing Company, covering the furnishing and erection of structural steel for extension to Generator Building and extension to Boiler House, Station "B," Oakland, Cal.

Contract with the Pacific Fire Extinguisher Company, covering the installation of electric system, Van Ness Avenue, San Francisco, Cal.

Contract with W. M. Jenkins Machine Works, covering the purchase of two Hydraulic Stack Valve Lifts for Gas Generators, Potrero Gas Works, San Francisco, Cal.

Contract with the Western Iron Works, covering the erection of sub-floor, Generator Building, Potrero Gas Works, San Francisco, Cal.

Contract with W. L. Gillham & Son,

San Jose, covering the wrecking of ice plant building at Los Gatos, Cal.

Contract with the Asbestos Protected Metal Company, covering the furnishing and installation of asbestos protected metal on roof and sides of extension to Generator Building and extension to Boiler House, Station "B," Oakland, Cal.

Contract with the Oliver Continuous Filter Company, covering the purchase of two Oliver Drum Filters and one Dewatering Filter for Metropolitan Gas Works, San Francisco.

Contract with the United Iron Works, Oakland, covering the purchase of two 6-inch, one 8-inch and two 10-inch centrifugal pumps for filter installation, Metropolitan Gas Works, San Francisco.

Contract with Duncanson-Harrelson Company, covering the construction of two pile and concrete foundations for compressors, Metropolitan Gas Works, San Francisco.

Contract with Geo. A. Bos, covering a steel and concrete extension to building at Metropolitan Gas Works, San Francisco.

Contract with Schaw-Batcher Co. Pipe Works, covering the purchase of a 6x30-foot compression tank for Metropolitan Gas Works, San Francisco.

The Financial Side of "Pacific Service"

Following is a condensed statement of the Company's income and surplus accounts for the year 1914, with comparisons against the year 1913:

	1914	1913	INCREASE	DECREASE
Gross Operating Revenue	\$16,912,687.92	\$15,869,005.99	\$ 1,043,681.93	
Deduct Maintenance, Operating Expenses, Taxes and Reserves for Uncollectible Accounts and Casualties.....	8,913,921.58	9,331,206.57		\$417,284.99
Net Earnings from Operation	\$ 7,998,766.34	\$ 6,537,799.42	\$ 1,460,966.92	
Add profit on Merchandise Sales and other miscellaneous income	307,815.77	333,331.38		\$ 25,515.61
Total Net Income.....	\$ 8,306,582.11	\$ 6,871,130.80	\$ 1,435,451.31	
Bond Interest.....	3,890,341.43	3,783,197.44	107,143.99	
Balance.....	\$ 4,416,240.68	\$ 3,087,933.36	\$ 1,328,307.32	
Interest on One Year Notes and Floating Debt (temporary).....	301,059.96	118,847.56	182,212.40	
Balance.....	\$ 4,115,180.72	\$ 2,969,085.80	\$ 1,146,094.92	
Bond Discount and Expense.....	147,714.71	147,490.87	223.84	
Balance.....	\$ 3,967,466.01	\$ 2,821,594.93	\$ 1,145,871.08	
Discount and Expense on One Year Notes (temporary).....	321,800.30	98,550.63	223,249.67	
Balance.....	\$ 3,645,665.71	\$ 2,723,044.30	\$ 922,621.41	
SURPLUS ACCOUNT.				
	1914	1913	INCREASE	DECREASE
Balance from Income Account...	\$ 3,645,665.71	\$ 2,723,044.30	\$ 922,621.41	
Deduct Dividends:				
First Preferred Stock	14,983.37		14,983.37	
Junior Preferred Stock.....	600,000.00	600,000.00		
Common Stock.....		308,848.22		\$398,848.22
Balance.....	\$ 3,030,682.34	\$ 1,724,196.08	\$ 1,306,485.26	
Less Reserves:				
For revenue involved in pending rate litigation.....	554,362.02	261,733.55	292,628.47	
For Depreciation.....	1,000,000.00	1,462,462.53		\$462,462.53
Balance to Corporate Surplus.	\$ 1,476,320.32		\$ 1,476,320.32	

The income account for 1914 contains a charge of \$301,059.96 for interest on gold notes and floating debt and an additional charge of \$321,800.30 for discount and expense on one year gold notes. These two items, aggregating \$622,860.26, reflect temporary conditions in the Company's financial situation which have largely disappeared and are about to be entirely removed. Since January 1, 1915, the Company has paid all of its floating debt, amounting to about \$1,400,000, and has also called for redemption of its outstanding one year gold notes. These redemptions will leave but \$1,500,000 of the latter still outstanding as compared with the maximum amount of \$7,000,000 outstanding a year ago. It is anticipated that the remainder of these notes will be redeemed in the very near future, which will result in entirely relieving

the income account of this heavy charge for note interest and discount. During 1914 the Company also expended \$2,734,000 for new construction.

This marked improvement in the condition of the Company's current finances has been brought about in part through the application of surplus earnings, no dividends having been paid during 1914 except upon preferred stocks, and in part through the sale to the Company's stockholders and others of a new issue of First Preferred 6% Stock which was authorized by the Railroad Commission on July 1, 1914. To March 1, 1915, \$9,356,400 par value of this stock had been sold to more than 4,000 individual subscribers, to net the Company \$7,719,030. Of this amount the Company has actually received \$6,176,335, leaving \$1,542,695 still due on installments maturing April 1, July 1 and October 1, 1915. About \$850,000 cash received from stock sales is still in the Company's treasury.

From the 1914 surplus a reserve of \$554,362.02 was set up to cover revenue involved in litigation over gas rates in Sacramento and gas and electric rates in the city of San Francisco. Of these three suits the one concerning gas rates in Sacramento has been finally decided in the Company's favor. The Standing Master in Chancery of the District Federal Court, San Francisco, has also found for the Company in the two San Francisco cases, and his report is now before the court for final disposition. At the present time only the gas rates in San Francisco are in question, the city having, as of July 1, 1914, adopted an electric schedule satisfactory to the Company. The amount of earnings in dispute in 1915 will, therefore, be relatively small.

One million dollars was transferred from surplus to depreciation reserve in 1914 as against \$1,462,462.53 in 1913. The reduction of this account was forecasted in the Company's annual report for the year 1913 in which it was stated that its plant schedules had been cleared of everything except properties in actual operation, real estate and other assets of undoubted present value, and that in view of this cleared up condition of the Company's property schedules only normal annual charges would be necessary in future to provide for losses occasioned by wasting assets.

Reserves at December 31, 1914, after charging off all realized losses, stood as follows:

For Depreciation.....	\$2,471,862.23
Insurance and Casualty Funds.....	49,537.47
Uncollectible Accounts Reserve.....	130,000.00
Reserve for Earnings in dispute.....	816,095.57

The balance sheet of December 31, 1914, when published, will show current assets of \$8,190,659.13 and current liabilities of \$5,056,083.55.

Steady growth is indicated by the following eight year comparison of gross income:

1907.....	\$11,342,140	1911.....	\$14,604,609
1908.....	12,657,305	1912.....	14,744,651
1909.....	13,491,288	1913.....	16,202,337
1910.....	14,044,596	1914.....	17,320,504

During the past year the Company made a net addition of 29,321 consumers, bringing the total number of customers served by the Company at the close of 1914 up to 378,705. As shown in the following table the gain in customers during the past seven years has been at the average rate of 28,000, or a little better than 15% per annum. The additional customers on the books at the beginning of the current year will, it is estimated, produce an increased gross revenue during 1915 of at least \$1,000,000. A substantial addition to revenue is also assured from the exclusive contract which the Company has for supplying the Panama-Pacific International Exposition with gas and electricity for heating, power and illuminating purposes.

	GAS	ELECTRIC	WATER	STEAM	TOTAL
Dec. 31, 1907.	122,304	54,772	5,539		182,615
" 31, 1908.	131,235	62,026	5,753		199,014
" 31, 1909.	139,503	70,515	6,360		216,378
" 31, 1910.	162,395	83,005	6,726		242,126
" 31, 1911.	176,131	102,024	7,257	101	285,513
" 31, 1912.	194,914	117,065	8,027	211	320,217
" 31, 1913.	208,268	132,353	8,479	281	349,384
" 31, 1914.	220,360	148,957	9,051	337	378,705
Increase in 7 years.	98,056	94,185	3,512	337	196,090 or 107%

The average return per consumer in 1914, expressed in terms of gross operating revenue was \$44.65 as compared with \$45.40 during the preceding year. Favorable inferences as to the stability of the Company's business, dependent as it is upon a large number of customers with a moderate average return from each, may readily be drawn from these averages.

NEW BUSINESS FIRST TWO MONTHS OF 1915.

In January, 1915, the Pacific Gas and Electric Company made a net gain of 2,775 consumers. In February the gain was 2,983, a total net gain for the two months of 5,758. This compares with 2,404 consumers gained in the first two months of last year.

The showing for the first two months of this year is therefore better by 3,354 consumers.

The following table shows the number of consumers in each department served at February 28, 1915, compared with February 28, 1914, with the growth in each department during the twelve months period:

	FEB. 28, 1914	FEB. 28, 1915	GAIN IN 12 MONTHS
Electric.	134,252	152,233	17,981
Gas.	208,961	222,036	13,075
Water.	8,428	9,045	617
Steam.	297	353	56
	351,938	383,667	31,729

FURTHER NOTE REDEMPTIONS.

The Company has called for redemption on April 22, 1915, an additional amount of \$1,500,000 of its one year 5% notes maturing December 15, 1915. This will reduce to \$1,500,000 the balance of these notes still outstanding, as compared with \$7,000,000 of one year notes outstanding a year ago. The Company has no other floating debt. The numbers of the notes to be redeemed were drawn by lot by the Bankers' Trust Company, New York, in accordance with the provisions of the note agreement.

FIRST PREFERRED STOCK SALES.

Sales of First Preferred 6% Cumulative Stock from January 1, 1915, to April 5, 1915, inclusive, have aggregated \$787,200, making the total to the latter date, since the stock was first offered on June 3, 1914, \$9,585,600.

In connection with the foregoing the following announcement has been made by the Company:

"Approximately 80% of the issue having been sold, the Company begs to announce that from and after April 1, 1915, and until further notice, none of this stock will be sold except to investors residing within and contiguous to the territory in California served by the Company."

WHAT A NEW YORK INVESTMENT BANKER THINKS OF OUR FIRST PREFERRED
6% CUMULATIVE STOCK.

The following compact, yet comprehensive, analysis of the salient features of our new First Preferred 6% Stock has been made by a New York investment banker:

- (1) The Company has had the approval and commendation of the California Railroad Commission in issuing this stock. All additional issues must meet the high standard of physical value and established earnings demanded by the Railroad Commission to secure its approval, a safeguard of prime importance to the investor.
- (2) The Company serves thirty counties in the central portion of California, an area of 37,000 square miles, a district approximately equal to 80 per cent of the area of New York State, and entering over 200 cities and towns.
- (3) The Company is one of the five largest public utilities in the United States and is now serving 378,000 consumers with gas, electricity or water.
- (4) The gross earnings have increased at an average of \$800,000 per annum for the last seven years.
- (5) The net earnings, prior to reserves, is equivalent to more than five times the dividend on the first preferred stock, and is equivalent to three times the dividends on both the first and second preferred stocks.
- (6) The Company has practically no floating debt and the small note issue outstanding has been provided for and should be retired within the next few months.
- (7) The Company has no large construction in contemplation and comparatively little new money should be required, notwithstanding the fact that its consumers are increasing now at the rate of 28,000 per year.
- (8) The stock of the Company is widely distributed: 46% being held on the Pacific Coast; 13% in the middle western states; 30% in the eastern states; 11% in Europe. The fact that the Company's issues are held by approximately 6,000 different stockholders insures a wide and well-established market.
- (9) According to Engineer's appraisal, to which has been added the capital improvements, there is an equity following the first preferred stock of approximately \$23,000,000. There is at the present time in market value of junior securities an equity of approximately \$23,000,000.
- (10) The franchises under which the Company operates in cities and towns have recently been held by the United States Supreme Court as perpetual.
- (11) Within the last year a well-constructed plan of financing has been adopted by the Company, approved by the Railroad Commission, making available securities from the sale of which the Company's growth in its vast territory can be safely and economically financed.
- (12) The management is noted for the co-operation it has developed within its organization, making possible a high degree of economy and efficiency. More than 40% of the Company's employees are stockholders.

Of Personal Interest to Our Members

We take great pleasure in announcing the marriage of Mr. Emmet Nicholson Britton, youngest son of Vice-President and General Manager John A. Britton, and Miss Lydia Rebecca Boalt, a charming young lady of St. Helena, Napa County.

The engagement of this young couple was announced in our January number. The wedding took place on Wednesday, March 24th, in St. Helena and, needless to say, Mr. Britton was present to see his youngest off-spring launched upon the waters of matrimony.

Mr. Emmet Britton's occupation with the company is assistant superintendent of Drum District, so after a brief honeymoon the happy pair took up their residence in a little brown cottage on the hill at Colfax, where they are now "at home" to friends.

"Pacific Service Day" was eventful in more ways than one. We take pleasure in recording an unusually interesting event that took place on that day. Precisely at ten o'clock in the morning, as Grand Marshal E. C. Jones gave the signal for the parade to start, he became a grandfather. This happy bit of news was conveyed to him while he was on the bandstand during the exercises.

The new-comer is the son of Leon Barrett Jones and Marie Bertaud Jones and has been named Edward Bertaud Jones. Mr. Leon Jones is well known throughout the company and is, as we all know, not only following in his father's footsteps but has himself already been recognized for his work of invention and development in the gas business.

"Pacific Service" congratulates the Jones family on this happy event and extends cordial welcome to the boy born on "Pacific Service Day."

We are glad to report that our Mr. Charles L. Barrett, Assistant Secretary of

the company, has almost entirely recovered from an attack of pneumonia which confined him for a short while in St. Mary's Hospital in San Francisco.

The attack grew out of a severe cold and for a while threatened to be serious, but Mr. Barrett is now rapidly convalescing at his country residence at Corte Madera, in Marin County, and his many friends in "Pacific Service" hope to see him about again very soon.

On March 15th Miss Jeanette May Robinson of San Francisco and Mr. Will Remington Ernst, a member of the book-keeping department of the San Francisco District, were married at Martinez. The marriage came as a surprise to their friends, as it had been announced that it would take place in June.

"Pacific Service" extends good wishes to the young couple.

On February 20th, Mr. Robert F. Ballard was married to Miss Hazel M. Nattinger. Mr. Ballard is employed in the Electric Department, Oakland Office, Alameda County District.

It is with sincere regret that we report the passing away, on April 1st, of Miss Maude Smith at San Lucas, Monterey County, Cal.

Miss Smith started to work for the company in May, 1908, in the Electric Distribution Department of the San Francisco District, and remained in that department until 1913, when she took a year's leave of absence on account of her health. On her return she was employed in the Gas Distribution Department, and, after working for a few months in that department, was compelled to resign on account of ill-health.

She had endeared herself to everybody by her cheerful and lovable disposition, and the company takes this means of extending to her family sincere sympathy in the loss of a loving daughter and sister.

DOINGS

of "PACIFIC
SERVICE" SECTION

N.E.L.A.

CHRONICLED BY ERNEST B. PRICE

The regular monthly meeting of the Section was held on Friday evening, March 12th, at National Union Hall, San Francisco. The feature of the session was an address by Mr. G. I. Kenney of the General Electric Company, who gave a splendid description of his company's "Home Electrical" exhibit at the Panama-Pacific International Exposition. Lantern slides were used to illustrate the electrical equipment in the various rooms of the modern dwelling house.

Chairman Stanley Walton followed Mr. Kinney with a short talk, also illustrated by slides, showing the uses of electricity on the farm and in reclamation projects. Mr. T. E. Bibbins of the General Electric spoke briefly of the "Home Electrical" display, and Mr. Harry McLaren, of Schenectady, entertained the members with songs and monologues from the repertoire of Harry Lauder. The closing number on the program for the evening was a selection by the Glee Club, which was enthusiastically applauded.

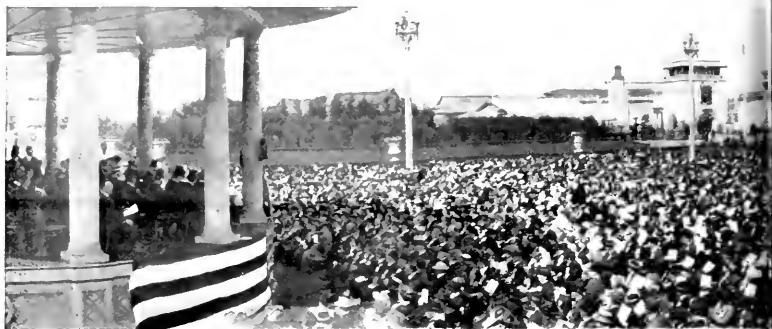
On Friday evening, March 26th, at National Union Hall, San Francisco, the Industrial Department, under the leadership of Mr. H. P. Pitts, assisted by Messrs. J. E. Van Hoosear, E. V. Daily and E. Zimmerman, gave a most interesting meeting. In his remarks to the Section Mr. Pitts outlined the work of the Industrial Department and its relation to the other departments of the company, and then presented Mr. Van Hoosear, who dealt with that particular phase of the Industrial Department work which either contemplated the displacement of existing sources of power by motor or the substitution of the motor power in proposed installations involving the use of steam, oil and gas engines, windmills or water

syphons. Mr. Van Hoosear called attention to various difficult conditions encountered in substituting motor power for the above mentioned prime movers, and showed how the Industrial Department, acting in a consulting capacity for the consumer, analyzed and solved many perplexing problems to the ultimate satisfaction of the consumer.

Mr. E. V. Daily spoke on the use of gas in the industrial field and its varied application. The speaker emphasized certain facts, namely, that the governing factor in any manufacturing process was the net cost of the finished article, and also that the direct fuel cost was only one of the items to be considered in arriving at the net cost of any product; secondly, that by correct application of gas fuel two important results could be obtained: the net cost of the finished product could be reduced or the quality of the product could be so improved that an increase in the net cost would be fully warranted. By working along these lines, he said, and co-operating with the manufacturer, gas fuel was now being used in many processes where it was thought impossible a few years ago. Mr. Daily then illustrated by means of slides how gas fuel had displaced coal, fuel oil and wood in various industries. He predicted that gas would be the fuel in the industrial field.

Mr. E. Zimmerman followed with an instructive address on the manufacture of the incandescent lamp.

A rising vote of thanks was tendered Mr. Pitts and his department at the conclusion of the meeting. We cannot speak too highly of the work which is being done at our Sub-Section and monthly meetings and trust that all those who can will attend regularly.



The crowd at the exercises on "Pacific Service" day radiated from the



After the exercises, a number of the participants and

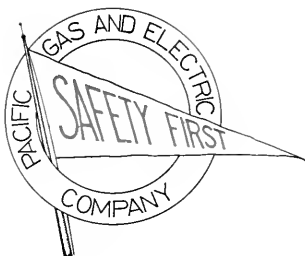
(See story "Pacific Service Day" at the Exposition, page 363.)



Physical Concourse to the broad avenues beyond and numbered 5000 strong.



Self pictures taken by the ever-present photographer.



SAFETY BULLETIN

No. 11.

March 15, 1915.

A Safety Museum has been established by the State Industrial Accident Commission in the Underwood Building, 525 Market Street, San Francisco.

There are on display the latest safety devices, the most modern machinery guards, and hundreds of photographs showing safety methods and devices in use all over the United States.

The exhibit is interesting and instructive. Every superintendent, foreman and workman who prides himself on his work, and who desires to be up-to-date should see it.

It is the desire of the Central Safety Committee and of Mr. Britton, that all District Managers, Superintendents, Foremen and Employees visit this exhibit at the first opportunity.

The exhibit is open from 9 to 5, except on Sundays, holidays and Saturday afternoons.

CENTRAL SAFETY COMMITTEE.

A. J. PILLSBURY

WILL J. FRENCH

HARRIS WEINSTOCK

M E M B E R S

Industrial Accident Commission of the State of California

H. L. WHITE, Secretary

UNDERWOOD BUILDING, 525 MARKET STREET, SAN FRANCISCO

*Pacific Gas and Electric Company,
445 Sutter St., San Francisco.*

March 13, 1915.

Gentlemen:

Attention Claims Department.

Your circulars headed "Safety Bulletin" have just been received. In behalf of the Industrial Accident Commission, I thank you for this splendid evidence of your co-operation. We are anxious to have all men and women interested visit our Safety Museum at 525 Market Street, and the invitation you issued to those associated with the Pacific Gas and Electric Company is fully appreciated. Any time our Safety Department can prove of service to those of your Company, please let me know.

Sincerely yours,

WILL J. FRENCH (Signed)

WJF:B

Commissioner.

Mosswood Park, Oakland

"Pacific Service" Has the Honor of Lighting the First Large Playground to Be Open to the Public for Night Use

THE Park Commissioners of Oakland early recognized that a public park is a delight by day and a menace by night. The night feature objection was met by the installation of lamp-posts throughout the parking portion and economy was found in the two-mantle gas street "gasolier." Light has a splendid policing effect. The result is that Oakland has an excellent system of parks, available and safe at night.

However, the parks serve the daylight hours well but have a limited use at night. The park commission then decided that we could create a demand for play at night. This inspiration came from seeing the demand made by children playing during the day from early hours to dusk.

A central playground was chosen, a beautiful spot, Mosswood Park. This is a natural park of ravines and overhanging oaks with spreading branches and a wild growth about—typical of California. Then, too, there are nooks and turns under intense cultivation where giant eucalyptus add their stalwart beauty to the setting.

A portion of the parking arrangement hides a playground—baseball, football, tennis, volley ball, basket ball, swings and sand boxes for the little ones, outdoor gymnasium consisting of the usual horizontal bars, flying rings, trapezes, ladders and tobogans.

The designing of the illumination was done under the supervision of Mr. George R. Babcock, Superintendent of the City Electrical Department. After a careful consideration of the multiple flame arc, the series magnetite arc, the series carbon arc, series tungsten and the nitrogen-filled tungsten, it was decided to use the nitrogen-filled multiple unit. The mul-

tiple flame arc was eliminated, due to its high maintenance cost, the series carbon and magnetic arcs on account of the high voltage and the series tungsten unit because of its relative inefficiency. The nitrogen-filled mazda was chosen because of its efficiency and because its upkeep expense compares favorably with the other units considered.

The football field is lighted with five 750-watt units. One thousand watt units are used to illuminate the swings and gymnasium apparatus. These units are placed on gooseneck boulevard posts twenty feet above the ground. Since this is about the first playground in the country to be lighted in this way it was decided to light only part of it as a trial. One hundred and fifty watt multiple type mazdas mounted on gasolier posts, which were cleverly designed into single unit electrolier posts, are used for general illumination of the paths and walks.

Oakland has thus extended the usefulness of its park holdings into hours of the night. Parks represent a vast capitalization and the results are imperative; eighteen hours a day is a one hundred and fifty per cent investment.

It is here that both old and young who have to devote the daylight hours to work can take advantage of healthful and invigorating diversion and amusement by outdoor play amidst beautiful surroundings. The success of the undertaking was assured from the opening night. The attendance of men, women and children of all sizes and all ages has been a pleasing surprise even to the most sanguine.

"Pacific Service" has the honor of lighting the first large playground to be open to the public for night use.

Pacific Service Magazine

PUBLISHED IN THE INTERESTS OF ALL EMPLOYEES OF
THE PACIFIC GAS AND ELECTRIC COMPANY

JOHN A. BRITTON - - - - EDITOR-IN-CHIEF
FREDERICK S. MYRTLE - - - MANAGING EDITOR
A. F. HOCKENBEAMER - - - BUSINESS MANAGER

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The Pacific Gas and Electric Company desires to serve its patrons in the best possible manner. Any consumer not satisfied with his service will confer a favor upon the management by taking the matter up with the district office.

VOL. VI.

APRIL, 1915

No. 11

EDITORIAL

It always gives pleasure to both say and hear pleasant things, and the memory of a pleasant incident lingers long. When President Moore of the Panama-Pacific Exposition Company, Mayor Rolph of San Francisco and others who took part in the exercises on "Pacific Service Day" spoke words in commendation of our public service organization as one on intimate and friendly terms with the public it serves, every one of us who are of that organization felt a thrill of pride strike straight to the heart.

"I am proud to be wearing a corporation badge," said Mr. Moore, and there was not a dissentient note in the chorus of response that was sounded by the great throng gathered there. That indeed marked a departure from the old order of things. Say, rather, that it marked the dawn of a new era that has opened to our Western civilization, an era of mutual confidence and esteem replacing the old doubt and distrust. And we are glad that it is so, for nothing else can insure our commonwealth against setback in its onward march. So, we have a double reason to feel proud, in the realization that this new era is upon us and in the consciousness, not merely that we played a part, however small, in

bringing it about, but that the optimism that sustained us through many a dark day in the past is found to have rung true.

In this number, under the heading "The Financial Side of Pacific Service," will be found a condensed statement of the company's income and surplus accounts for the year 1914, with comparisons against the year 1913. This statement reveals a remarkably flourishing condition of affairs which we may be pardoned for calling to the special attention of our readers.

The company has paid off all of its floating debt and is rapidly calling in its one-year gold notes, of which there were \$7,000,000 outstanding a year ago. In fact, since the annual statement was prepared a call has been issued for the redemption of \$1,500,000 more of these notes, so that there remain but \$1,500,000 outstanding. These will be paid off in a few months.

Concerning this marked improvement in the condition of the company's current finances Second Vice-President and Treasurer A. F. Hockenbeamer says: "It has been brought about, in part, through the application of surplus earnings, no dividends having been paid during 1914 except upon preferred stock, and, in part, through the sale to the company's stockholders and others of a new issue of first preferred six per cent stock which was authorized by the Railroad Commission on July 1, 1914."

We commented upon the wonderful activity of this stock issue in our last number and we quoted a well-known financial authority to the effect that it was "an amazing operation, which has excited the wonder of the whole financial world." It should interest our readers, then, to know that up to and including March 25th, the company sold \$9,541,900 par value of this issue to 4,095 purchasers. Furthermore, although this stock was first offered several months ago it is still in demand at the rate of approxi-

mately \$250,000 per month. This looks decidedly healthy.

On the operating side "Pacific Service" reports a gain of 29,321 consumers during the year accounted for in the company's report. In January this year the company made a net gain of 2,775 consumers and in February 2,983, a total net gain for two months of 5,758. This is marching on with a vengeance. We are proud to be able to record these figures and, at the same time, quoting the words of our President, Mr. Drum, at the "Pacific Service Day" exercises, "We hope we will always merit the confidence and respect reposed in us."

The Electrical Development and Jovian League of San Francisco, whose rejuvenation was announced in the early days of the present year, held a rousing meeting on March 17th. Our Mr. Stanley Walton, who was chairman of the day, had secured his chief, and ours, Mr. Britton, for an address on "Co-operation Between Manufacturers and Distributors," and his announcement of this attracted an unusually large attendance.

Mr. Britton preached the doctrine of co-operation, of team-work, as an indispensable agent in the accomplishment of results in any and every direction of enterprise. "No man can accomplish anything alone, without help," he said. "We of the public service corporations feel the need of it in more ways than one. We need co-operation within our organization and, besides, we need the co-operation of the public to achieve results."

Mr. Britton sketched the history of gas and electric appliances, mainly for the purpose of showing that the central stations had in the beginning been literally forced into the appliance business by reason of the failure of the manufacturers to co-operate with them in their desire to educate the public to the various uses to which the commodities they dealt in could be applied. The companies had to be their own distributors and, speaking of gas, since its first development for

commercial purposes in the early part of the nineteenth century to almost the present day there had not been any material change in the process of distribution, it being merely a question of extending the use of already installed apparatus. As for electricity, five years ago the electric appliances then on the market were utterly inapplicable for the use of electric energy. This was proven by the fact that today there it not a central station in existence that was operated as far back as 1880 and very few that were in operation ten years later; not a generator in operation today that was operated ten years ago. "In fact," said Mr. Britton, "the gas and electric companies endured so many hardships that they were loath to co-operate with the manufacturers at all."

Now, however, all that had been changed, a new era opened, an era of co-operation, of team-work. High-pressure gas, at one hundred and ten pounds to the square inch, was working wonders in the distribution of this ever popular commodity, while diversity factors and load factors were filling up the gaps and valleys between the peaks in the electric distribution charts. The speaker instanced the Home Electrical Exhibit of the General Electric Company in the Palace of Manufactures at the Panama-Pacific Exposition.

Mr. Britton thought the time was come when public utilities need no longer take hand in the appliance game. "They should give up the business," he said. "Let the manufacturers co-operate with the utilities, as they have begun to do, and their co-operation will mean better goods to the public and better results to both manufacturer and distributor."

Co-operation was the keynote of the entire meeting, and a motion by Mr. A. H. Halloran that a public policy committee be appointed to bring about better relations between the public and the public service corporations was seconded by Mr. T. E. Bibbins and carried.

Sporadic Insulator Troubles

By P. M. DOWNING, Engineer O. & M. Department, Hydro-Electric Section

(Paper read before San Francisco section, A. I. E. E., November 27, 1911.)

EVERY utility company engaged in the selling of electric energy for power and lighting purposes is vitally interested in furnishing cheap, continuous and reliable service.

On this coast, owing to the high cost of fuel, a very large part of this energy is generated at hydroelectric plants and transmitted for considerable distances at high voltages. In many instances these transmission systems embrace hundreds and, possibly, thousands of miles of high voltage line, and when you consider that these lines are constructed through every imaginable kind of country, and exposed to every climatic condition, it is not at all surprising that the transmission line is the weakest link in any hydroelectric system. A slide may occur in a ditch, or a flume may go out, thus reducing, or shutting off entirely the water supply of a power-house; or trouble may develop in the power-house, or in a substation apparatus, without affecting service in any way; but the real troubles of a power transmission company are line troubles.

Disturbances of this kind are so far-reaching and so gen-

eral in their effect on service over the entire system that it may be safe to say that the continuity of service furnished from any transmission line is dependent on the stability of the line.

As the time allowed for the reading of the different papers to be presented this evening is somewhat limited I will not attempt to cover the entire subject at great length, but will confine my remarks to a discussion of the troubles experienced in connection with the operation of high

voltage grounded neutral systems using the common pin-type insulators.

Actual results extending over a period of several years show that on one system operating in this State approximately 82 per cent of all interruptions to service were caused by line troubles. Of these approximately 55 per cent were of a temporary nature, and caused only momentary drops in voltage.

These temporary disturbances are generally the result of arcing between conductors, or between one conductor and ground, and clear themselves immediately the voltage drops. They are not serious in their effect on the service, as in a majority of



60 K. V. pole and cross-arm entirely burned away without affecting service.

cases they do not last long enough for switching to be done either automatically or manually. Very often the burned remains of cranes, pelicans, or other birds having a wide spread to their wings, found lying under the line, or of tree squirrels, smaller birds, etc., found at the base of the pole, furnish substantial evidence as to causes of the disturbances.

Burned poles cause, approximately 9 per cent of all line troubles. These are much more serious in their effect on the service than the momentary drops in voltage, as they leave the line inoperative, and the interruptions, therefore, are of longer duration because of the time required to do the switching. These fires occur as the result of leakage over the surface of the insulators, and as yet there

does not seem to be any satisfactory explanation of why they occur or how they can be prevented. The amount of leakage, as measured in amperes, is so small that it cannot be detected as an unbalance in load. Insulators, which in the laboratory will not flash over on either dry or wet tests at voltages several times that under which they normally operate, will under certain climatic conditions leak over and start pole fires.

Pole fires occur most often in the fall, when the heavy fogs or early rains fall on a summer's accumulation of dust and form a low resistance leakage path to ground over the surface of the insulator. However, there is no reason to think that this accumulation of dirt is alone responsible for the burning. On the con-

trary, there is every reason to think that there are other elements involved. It is not unusual to have the burning take place on lines where the insulators will have been cleaned not more than a few days previously. Lines in the mountains, or outside of the fog districts, give less trouble than those near the bay; again, there is less trouble on tall poles than on short ones; for example, there is less trouble where the insulators are 40 to 50 feet above the ground than where this

distance is only 25 to 30 feet. During the winter months, after the heavy rains have had an opportunity to wash off the dirt the trouble disappears almost entirely.

There are two ways of reducing the liability of trouble of this kind:

First: Metal pins connected together electrically, but not

grounded, should be used. Ordinary No. 9 galvanized iron wire, wrapped around the pins and fastened to the pole and arm with staples, has been found to be very satisfactory. The shorting wire should be carried down to below where the quarter brace is attached to the pole.

Grounding the pins does not give any additional safety against burning, and is objectionable because the arcing distance from line wire to ground is very greatly reduced.

Second: Insulators, particularly those on lines around the bay, should be cleaned at least once each year just before the rainy season sets in. The usual way of doing this is to use a cloth saturated with kerosene. As I have already stated, cleaning in this way does not always



Double circuit 60 K. V. pole burned off at crossing over telephone toll line. Accident discovered in time to prevent damage to adjacent lines, and without interrupting service.

eliminate the trouble, and undoubtedly better results would be obtained if the insulators were all taken off the line and washed thoroughly. This, however, is impracticable because of the time and expense involved.

The design of the insulator has considerable to do with the leakage. As indicating the results that might be expected from the use of different types of insulators, I have in mind an 11,000-volt line constructed along a public highway near the bay, on which were originally used 11-inch 2-part porcelain insulators, designed to operate at 40,000 or 50,000 volts. The location of this line is such that considerable dust accumulates on the insulators, but even when they were clean there was so much trouble from poles burning that at times it was almost impossible to keep the line in service. Subsequently, these 11-inch porcelain insulators were replaced by 7-inch glass insulators carried on the same pins, and since the change was made, notwithstanding the fact that they are now seldom, if ever, cleaned, the burning has almost entirely stopped.

It will be of interest to know that these same 11-inch insulators are today in use on a 60,000-volt line in the foot-hill section, where they are not subjected to the same dust and fog, and are giving excellent service.

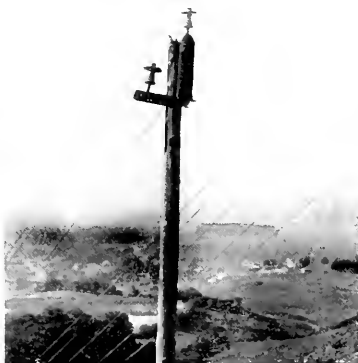
The surface glaze of porcelain insulators manufactured during the past few years does not seem to deteriorate with age to any appreciable extent. Some of the insulators used on lines built during the early days of high-voltage work had to be replaced

after being in service for a few years. Generally, however, it will be found that where the insulator has deteriorated to any great extent either the quality of the material is poor or it has been improperly handled. With the material now available and the present day knowledge of the art of manufacturing insulators, there is little reason to expect much further trouble from this source.

Some trouble is had with the tops of the larger diameter porcelain insulators cracking as a result, perhaps, of the expansion and contraction due to wide temperature variations. It is not unusual to have this trouble with glass insulators, and for this reason porcelain has almost entirely superseded glass for the larger sizes. These cracks appear on the circumference to the top of the biscuit, extending radially from the outer circumference to the top of the biscuit. They cannot be seen from the ground, and are quite hard to detect even by close and careful inspection. Although obviously shortening the leakage path to ground, there generally remains a sufficient margin of safety to prevent failure before they are located. Although the

general appearance of the insulator does not in every instance indicate it, there is every reason to think that the failures have occurred in overfired units that are too brittle to stand the internal strains set up under sudden or wide temperature changes.

Insulator failures due to puncture very seldom occur on star connected lines where the neutral is grounded. Lightning occasionally causes trouble, but it is just as liable to damage



A not uncommon accident, showing pole burned off at the cross-arm and method of repairing temporarily.

the pole or the line without damaging the insulator as it is to damage the insulator itself. Although but very few of the operating companies in this State have installed lightning arrestors, or protective devices, other than the old horn-type spark-gap with one side grounded, but little trouble is experienced from this source. In a few instances lightning has been known to strike high-voltage lines, burn off one or more conductors in the middle of a span or slightly damage a few poles without affecting the insulators. Often times

when disturbances of this kind happen near a station in which are located transformers or similar apparatus, the voltage will jump to ground either around the terminal bushings or at some other point where the distance will permit, without otherwise damaging the apparatus in any way.

The suspension-type of insulator has not been tried out as thoroughly as the pin-type, but thus far there is every reason to think that it will eventually suc-

ceed the latter on all high-voltage work regardless of whether the supporting structures be wood poles or steel towers. The pin-type insulator has about reached its limitations, both electrically and mechanically, and the time is not far distant when the manufacturers will be forced to re-rate them on a more conservative basis.

The continually increasing demands of the general public for better service will compel utility companies to improve their facilities for giving service by building up and strengthening the weak points.



Modern type of construction adopted to give better line insulation.

On most long distance transmission systems too much attention has been devoted to other parts of the system, leaving the economies to be made on the line. This has resulted in the use of too short poles, too light towers, insufficient insulation, etc., any one or all of which false economies represent a saving in first cost insignificant as compared with the loss that might be sustained by a single interruption to service as a result.

Fire Prevention—Warning

Especial care is solicited in connection with the handling and drying of blotters used for filtering transformer oil.

Two fires have occurred during the past ninety days in ovens, apparently due to overheating blotters which have been in process of drying. These blotters are

saturated with oil, and naturally of a highly combustible nature, and care and watchfulness should be exercised during the drying period. See that these ovens are located away from walls or inflammable material, which might be ignited in case of fire in the ovens. R. J. C.

Tidings From Territorial Districts

Alameda County District

The Oakland Commercial Department is well represented by John Clements.

He is booked in the dictionary as "mild, pleasant," from the Latin *clemens*. Thus defined he has a big heart, broad in his views and most takable. The only thing small about him is stature. People meeting him generally wonder how a man so little can represent so big a company. You can't make much of him as his last name is pronounced with a short double snap. You can't hold on to it like an oratorio. His first name is also short—John. He started out in the water business. Here he remained until the concern's stock got soaked with water, and when the squeeze came John, "short" yet "stocky," ducked and got from under. John then got into the gas business and also became a prohibitionist. But it was not for him to dry up; when he effervesces he is more fluent than ever. In those days consumers would complain about the brackish water. With a twinkle in his eye, he would assure them that the water, however, was just as wet as the pure virgin springs of the Sierras.

One day a good old lady rushed into the gas office, threw down the proverbial umbrella on the counter and in irate excitement ordered the water turned off for some fancied wrong. Of course John took to water, and stepping up to butt in, she showered him with the abuse. He took the soaking until she paused for breath, then with outstretched hand said, "Why, madam, this is not the water company—this is the gas company's office." She looked around, then with a thump on the counter exclaimed, "Then shut off the gas. I'll have some satisfaction."

You can't dampen his zeal, for he believes that people must have satisfaction from their standpoint; that is "justice" from their viewpoint is a decision in favor of the complainant. Let a customer get riled up with some high bill he owes and a storm is on. Decks are cleared for action. The man-of-war is Mr. Clements. He says: "Never plunge; it is only a squall. If you do, you may lose your sea-legs, and rolling and bumping never gets you anywhere. A calm comes which is sure to settle. Good humor is the pacifying oil. Heave to on the starboard; be right in your position." A lady says, "I refuse to pay the electric bill because I never used it." "Possibly you have a new electric heater, madam." She retorts,

"I am using no heater." He replies, "If you had, it might." Says she, "It wouldn't make a bill like that anyway." "O yes, madam, with long hours of use it might," with a smile on his face. Now mark her reply, "Well, what does a heater use?" It's the calm that settles.

He says to his wife, "I am sure I don't know what to get you for Christmas; what would you like?" She says, "Don't get anything for the house; get something personal; something for my back." Christmas, among other things, brought a nice fancy shirtwaist box and there, in delicate tissue paper, was a porous plaster. Good humor is a strong asset; lose your humor and you are wrecked.

Mr. Clements is a great lover of nature, and in his wonderful fund of experience he talks in interesting parables; comparisons he calls them. You want a drink of water. You turn the faucet on, reach for a cup, fill it to overflowing—drink; next put the cup down and then turn off the water; the water running all this time needlessly wasting many cupfuls. Now don't you think you have been using the gas in some such way? Gas and electricity are economical; it is the waste which is expensive. Yet some people expect the company man to come in at the end of the month and explain what they themselves should explain—why three cupfuls were drawn many times when only one could have been used. By the way, electricity is generally explained by analogy to water. Mr. Clements has the honor, sir, of being a charter member of the original *aqua verbum sap* school.

Recently he interviewed a man whose auto had mired in a gas trench. The party insisted that others had mired in the same place. John smiled, for he had investigated. "Yes," he replied, "it is quite likely, as it is a very wet place, being in front of a saloon." This business of smiling at no one's expense is a treat, dry at first, but dewily brings out the sunshine of life. He sees the humorous side and drags the other fellow out of the grouch. He is sincere in it all. No one is quicker than he to see an error or a wrong and make amends.

In a storm you can't always see the lighthouse. The other fellow is probably befogged. Wrecks are generally a question of viewpoint. Remember the story of the two frogs going up the opposite side of a mountain to see the other side. When they got to the top they looked around but their eyes being in the back of their heads they simply saw their own

country. They both remarked: "I can't see anything different so I will go back to my old home." We are all from Showme County, Missouri.

"No," says John, "I am not a webfoot yet, though I still puddle in water-gas and hydroelectric, and possibly water shall be my bier, who knows?"

The following was received from a lady consumer in Berkeley in response to a notification from the district office that her electric meter had been tested and found to be correct:

"Agreeable to your request,
We made a very careful test
To see if it could be believed"—
So reads your letter just received.

Kind sirs, you made a grave mistake
To think that I would dare to take
The liberty to doubt your meter;
Perfect works and hands so neat—err.

What I should really like to know
Is, why electric meters go
On going, when I am away,
As fast as when at home I stay?

Perhaps that barefoot burglar queer,
Came in when no one else was here,
And finding valuables so few
Took current, say, three-twenty-two!

During a recent rainstorm a man stood at a Berkeley corner under the protection of an umbrella waiting for a street car. A sudden shifting of the wind wrenched the umbrella from his hand and sailed it aloft into the 4,000-volt line overhead. Fireworks began to shoot and down came the line, plunging the neighborhood into darkness. Little does the average consumer realize the many causes for interruption; causes beyond control.

F. A. LEACH, Jr.

Sacramento District

A large delegation of about 125 employees from Sacramento attended "Pacific Service Day" at the Panama-Pacific International Exposition. A special train was procured from the Oakland Antioch & Eastern Railway, leaving Sacramento early Sunday morning and arriving at the Fair Grounds by ten o'clock. Return was made late Monday evening, thus allowing two full days for sight-seeing and pleasure which resulted in one continual round of enjoyment, everyone declaring that they had the best time ever.

C. W. McKILLIP.

Placer District

On March 8th the Placer District ditch agents gathered at Auburn in a general get-together meeting for the purpose of instruction. These meetings are held

occasionally in order that the best methods of operation and maintenance may be talked over and all become familiar with them.

A three-hour meeting in the morning was followed by dinner at the Freeman Hotel and then a short session concluded the general remarks and discussion of debatable points. There were twenty-seven present, and from reports obtained it is expected that very beneficial results will follow.

H. M. COOPER.

Marysville District

At a conference held this month the local City Council decided to call a bond election soon for the purpose of voting \$18,000 worth of improvement bonds. The proceeds from the sale of the bonds are to be used in extending sewers and making other improvements in the Ellis Lake district. The issue, as proposed, will be in three annual payments of \$6,000, the bonds to be taken up by local banks.

It is announced that the canning and fruit packing industry here is to be greatly increased this season. Demand for canned goods, due partly to the European war, is given as the cause.

Another reason for the expected large output is that there is to be an extra large fruit crop in Yuba and Sutter counties this season. On nearly every side fruit-growers have notified the cannery people of bumper crop prospects. A large number of young trees will come into bearing this season.

The big canneries in Yuba City and this city are being cleared for the opening of the season.

Arrangements are being made by two canneries to install additional machinery. Several new methods of handling the fruit by machinery are to be tried. Another cannery plant is to erect an addition.

It is expected that about 3,000 persons will be given employment during the summer months by the canning industry here. Last season about 2,000 were on the pay rolls.

Peaches will again range first in quantity, with tomatoes next. The packers will be mostly concerned with prunes and figs, a big crop of the latter product being assured for this season.

A mass meeting was called this month at the invitation of the Merchants and Employers' Association of Marysville and Yuba City for the purpose of better lining up the forces of the opposition to the Armour project, also known as reclamation district 1500 located in the southern end of Sutter County. Ways and means were devised for the defeat of certain bills before the Legislature.

which, it was claimed, were drafted for the purpose of helping the project along, and which are antagonistic to the best interests of Sutter County. The bone of contention is the eastern location of the by-pass, and which is causing the opposition of the county of Sutter, because of the damage and the expense it causes to land not benefited thereby. There is no objection to the by-pass being located in the center of 1500.

Members of the Sutter and Colusa counties boards of supervisors held a joint meeting at Meridian and discussed ways and means of repairing the bridge across the Sacramento river which was seriously damaged by the recent high water. A further meeting will be held with representatives of the Northern Electric Company on the proposition.

That the California Anti-Debris Association is destined to be a thing of the past will be made practically certain when the Sutter County board of supervisors vote to withdraw from the association. It will mark the conclusion of about thirty years of activity, during which time much good was accomplished. Although the board has not as yet disclosed the real reason for its action, it is intimated that it has resulted from the manner in which the affairs of the association have been conducted, principally from a legal standpoint. Furthermore, it is asserted that there is practically no further need for the association.

Most of the bottom land in both Yuba and Sutter counties is to be planted to rice this season. From present indications 20,000 acres will be drilled.

With late showers during the latter end of March everything points to a very prosperous season in this district.

J. P. POINGDESTRE.

Stockton Water District

Manager Hall sends us the following clipping from the Stockton Independent of March 27th as a sample of the campaign of "boost" being carried on by the people of San Joaquin County. It certainly presents a glowing picture to the prospective tourist:

Passenger steamers between Stockton and San Francisco are taxed to their full capacity these nights handling the increased traffic of visitors to and from the World's Fair who take the boat trip in preference to traveling by rail.

Departing from Stockton at 6 p. m. the steamer is silhouetted against one of the most beautiful and inspiring views imaginable that of the sinking sun passing through the red glow of the western horizon, taking a last glance of the glistening waters and casting its fading glow over the beautiful homes and pros-

perous farms to be seen on either bank of the San Joaquin, finally passing from sight over the crest of stately Mount Diablo. No wonder that even the powerful propelling wheel of the steamer seems to churn an accompaniment to the now familiar song "I Love You, California."

Patrons of the commodious steamers say the voyage presents attractions other than scenery, for after viewing the passing panorama their attention is directed to the dining hall, where a first-class table d'hôte dinner is served for 50 cents, after partaking of which the evening is pleasantly spent in the social hall, which in its home-like appearance reminds one of a social gathering at a private card party or dansant. A good night's rest in a spotlessly immaculate state room, the weary traveler is lulled to sleep by the now wafting sea breeze, to awaken in the morning almost directly under the Ferry building clock tower, while the morning sun also refreshed after its night of apparent oblivion shines brightly across the waters of San Francisco Bay as it rises over the Contra Costa hills, causes the passenger to exclaim, "What a charming spectacle, what a beautiful journey from Stockton to San Francisco without the exertion of traveling!"

Vallejo District

(From Vallejo Evening News, Wednesday, March 3, 1915.)

Although Vallejo now boasts of one of the finest gas plants to be found in the State of California, the Pacific Gas and Electric Company intends to further improve the works in Maryland street, and as a result new machinery costing thousands of dollars is being installed at the local gas plant. Manager A. J. Stephens is justly proud of the Vallejo plant, as it is the equal of any of the big system operated by the well known California corporation. Only in size is it outclassed by the works in San Francisco, Oakland and other large cities. Since taking over the Vallejo plant ten years ago, the Pacific Gas and Electric Company has expended over \$100,000 in making it modern in every respect, and as a result Vallejo enjoys an unsurpassed gas service.

This morning Manager Stephens received authority to have the Company's office in Marin street remodeled and when the proposed work is completed the gas company will have an office that will compare favorably with any similar place in this city.

The old horse-drawn wagon which has been used by the company for many years is to be replaced by a light motor-driven wagon which will enable the company's employees to cover the city in much quicker time than at present.



EAST PITTSBURGH WORKS OF
WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY

The largest manufacturing plant under one roof in the World.
Covers an area of more than 50 acres. Main aisles each 2,000 feet long.

800 carloads of electrical machinery are shipped monthly to all parts of the world.

Total number of employees exceeds 22,000.

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GENERATORS up to 30,000 K. V. A.

MOTORS to 10,000 H. P.

TRANSFORMERS to 10,000 K. V. A., in voltages ranging as high as one million volts.

CIRCUIT BREAKERS for the highest transmission voltages and capacities.

ELECTRICAL RAILWAY EQUIPMENT of every type and capacity.

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Slogan:—If not WESTINGHOUSE—not the BEST.

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"PACIFIC SERVICE" FURNISHES ALL OF THE ELECTRIC ENERGY AND GAS FOR
THE ILLUMINATION OF THE EXPOSITION BUILDINGS AND GROUNDS
AND FOR ALL POWER USED BY THE EXPOSITION AND BY
EXHIBITORS.

Managed by Californians.

Operated by Californians.

"PACIFIC SERVICE" REPRESENTS

- 4,648 employees in all departments.
- \$125,000,000.00 capital invested in gas, electricity, railroads and water plants.
- 38,000 square miles of territory in which it operates.
- 6,243 men and women as stockholders, of whom
- 1,630 employees are stockholders.
- 30 counties of the State in which it transacts business.
- 380,000 consumers served with gas, electricity, water and steam.
- 1,200,000 people served in 30 counties.
- 177 cities and towns in which it transacts business.
- \$5,300,000.00 annual wages paid employees in 1914.
- \$3.07 average daily wage paid each employee in 1914.
- \$12,141,500.00 expended in 1914 in California for labor and material.
- \$722,994.00 taxes paid to the State of California in 1914.
- 120,000 horsepower developed in 10 electric water-power plants.
- 110,000 horsepower developed in 4 electric steam plants.
- 230,000 total horsepower developed in 14 plants.
- 7,600,000,000 cubic feet of gas sold in 1914.

This amount of gas would fill a holder covering the Exposition ground and 270 feet in height.

- 17 gas plants.
- 19,000 miles of wire used in distributing electricity.
- 2,500 miles of mains used in distributing gas.
- 700 miles of mains and ditches used in distributing water.
- 600 miles of tracks of street railways operated and supplied with power.
- 40,000,000,000 gallons of water stored in 62 lakes.

This amount of water would cover the Exposition site 200 feet in depth, or would supply the City of San Francisco for 800 days.

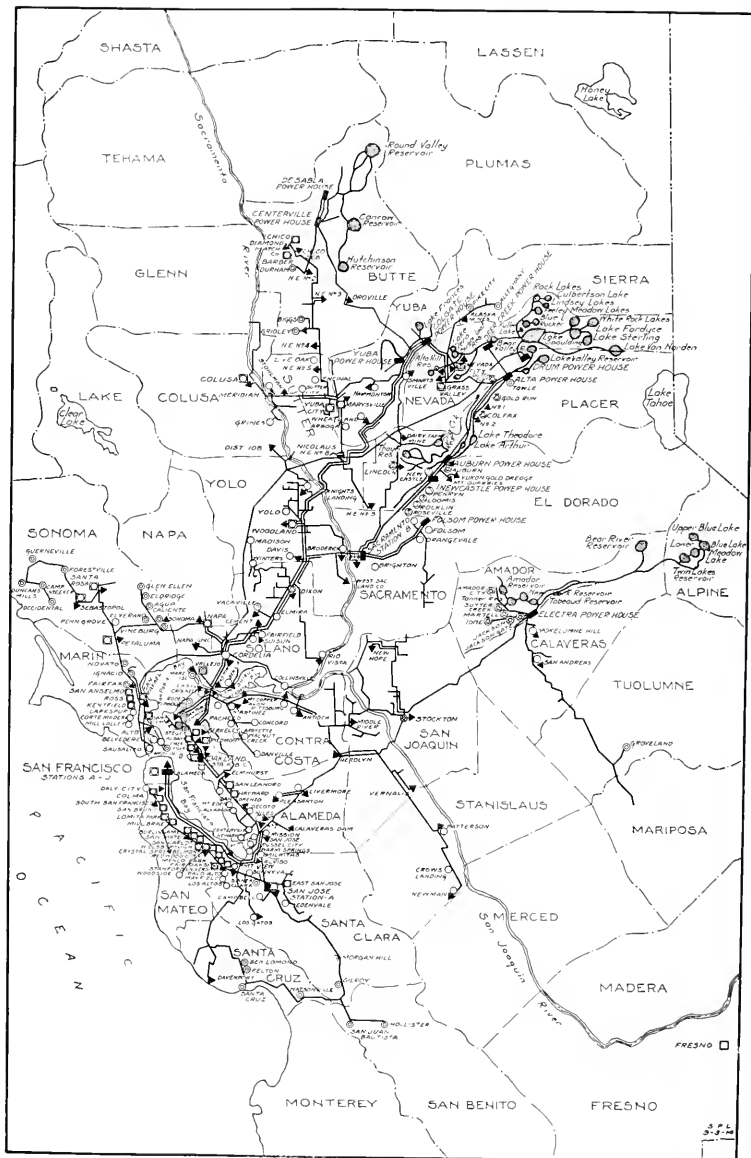
- 44,000 acres of land owned in California.
- 1,812,582 barrels of California oil used in 1914.
- 50,000 horsepower in agriculture depending on "Pacific Service."
- 155,000 horsepower in industrials depending on "Pacific Service."
- 33,000 street lamps, gas and electric, lighted by "Pacific Service."
- 3,000,000 incandescent lamps nightly lighted.
- 478,598 horsepower connected to system.

This represents the equivalent energy of 2,500,000 men.

THE PARTICIPATION OF "PACIFIC SERVICE IN THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION REPRESENTS

The spirit and energy of 10,891 employees, officers and stockholders of the Pacific Gas and Electric Company daily employed in the effort to make the Panama-Pacific International Exposition the success which the efforts of its officers, employees, architects, sculptors, artists and participants deserve for their individual and collective work—

"Palmam qui meruit ferat."



PACIFIC GAS AND ELECTRIC COMPANY

CITIES AND TOWNS SUPPLIED WITH GAS, ELECTRICITY, WATER AND RAILWAY

SERVICE FURNISHED	NUMBER OF CITIES AND TOWNS SERVED BY COMPANY			TOTAL POPULATION
	DIRECTLY	INDIRECTLY	TOTAL	
Electricity.....	126	49	175	1,221,218
Gas.....	48	2	50	1,125,068
Water (Domestic).....	8	11	19	58,690
Railway.....	1	..	1	75,602

Place	Population	Place	Population	Place	Population
*Alameda.....	27,000	*Gold Run.....	100	*Piedmont.....	1,720
*Albany.....	800	*Grass Valley.....	4,500	*Pike City.....	200
*Amador City.....	200	*Gridley.....	1,800	*Pinole.....	1,500
*Allegany.....	200	*Grimes.....	250	*Pittsburg.....	2,372
*Alviso.....	200	*Groveland.....	125	*Pleasanton.....	2,000
*Angel Island.....	280	*Guerneville.....	500	*Port Costa.....	600
*Atherton.....	250	*Hammononton.....	500	*Redwood City.....	3,200
*Auburn.....	2,375	*Hayward.....	4,000	*Richmond.....	10,000
*Agua Caliente.....	100	*Hillsborough.....	1,000	*Rio Vista.....	884
*Alvarado.....	900	*Hollister.....	3,000	*Rocklin.....	1,000
*Antioch.....	3,000	*Igoacio.....	100	*Roseville.....	2,600
*Arboga.....	100	*Irvine.....	900	*Rodeo.....	500
*Barber.....	300	*Jackson Gate.....	1,000	*Ross.....	500
*Belmont.....	350	*Jackson.....	100	*Russell City.....	250
*Ben Lomond.....	800	*Kentfield.....	2,035	*Sacramento.....	75,602
*Belvedere.....	1,000	*Kentfield Landing.....	250	*San Andreas.....	100
*Benicia.....	3,360	*Knightsbridge.....	350	*San Anselmo.....	1,500
*Berkeley.....	53,000	*Knightsee.....	125	*San Bruno.....	1,500
*Biggs.....	750	*Lafayette.....	100	*San Carlos.....	100
*Bolinas.....	500	*Lave Oak.....	200	*San Francisco.....	530,000
*Brighton.....	100	*Livermore.....	2,250	*San Jose.....	37,946
*Broderick.....	200	*Los Gatos.....	3,000	*San Leandro.....	4,000
*Burlingame.....	4,300	*Larkspur.....	600	*San Lorenzo.....	100
*Camp Meeker.....	200	*Lincoln.....	1,400	*San Mateo.....	6,500
*Campbell.....	600	*Loma Park.....	125	*San Quentin.....	2,500
*Centerville.....	1,000	*Loma Alta.....	500	*San Rafael.....	6,000
*Chico.....	13,000	*Loomis.....	400	*San Pablo.....	1,000
*Collinsville.....	150	*Madison.....	250	*Santa Clara.....	6,000
*Colma.....	3,500	*Madrone.....	100	*Santa Cruz.....	16,000
*Colusa.....	1,500	*Martinez.....	5,000	*Santa Rosa.....	10,500
*Concord.....	1,500	*Martell.....	150	*Sebastopol.....	1,200
*Cement.....	1,500	*Marysville.....	7,000	*Sausalito.....	2,500
*Colfax.....	500	*Mayfield.....	1,500	*Sheridan.....	150
*Columbia.....	150	*Menlo Park.....	1,500	*Smartsville.....	500
*Corte Madera.....	350	*Meridian.....	300	*South San Francisco.....	2,500
*Crockett.....	2,500	*Millbrae.....	300	*Stanford University.....	2,600
*Crow's Landing.....	375	*Millitas.....	300	*Sonoma.....	1,000
*Daly City.....	250	*Mill Valley.....	2,500	*Stege.....	1,000
*Danville.....	250	*Mission San Jose.....	500	*Stockton.....	35,000
*Davis.....	750	*Mokelumne Hill.....	150	*Suisun.....	1,200
*Decoto.....	350	*Mountain View.....	500	*Sutter City.....	1,500
*Dixon.....	1,000	*Morgan Hill.....	2,500	*Sutter Creek.....	1,500
*Davenport.....	1,000	*Mt. Eden.....	200	*Sunnyvale.....	1,500
*Durham.....	500	*Marc Island.....	500	*Tiburoo.....	400
*Dutch Flat.....	500	*Napa.....	7,500	*Towle.....	100
*Duncan's Mills.....	150	*Nevada City.....	2,700	*Vallejo.....	1,500
*Edenvale.....	500	*Newark.....	700	*Vallejo.....	13,600
*Eldridge.....	500	*Newcastle.....	750	*Vineburg.....	200
*Elmira.....	150	*Newman.....	1,000	*Walnut Creek.....	350
*El Verano.....	400	*Niles.....	800	*Warm Springs.....	200
*Emeryville.....	5,000	*Novato.....	250	*Watsonville.....	4,500
*Encinal.....	100	*Oakland.....	215,000	*Wheatland.....	1,400
*Fairfax.....	500	*Occidental.....	400	*Winters.....	1,200
*Fairfield.....	824	*Orange Vale.....	100	*Woodland.....	5,500
*Forestville.....	100	*Palo Alto.....	6,300	*Woodside.....	200
*Felton.....	300	*Pacifica.....	200	*Yolo.....	400
*Fresno.....	40,000	*Penryn.....	250	*Yuba City.....	1,200
*Folsom.....	1,800	*Patterson.....	300		
*Gilroy.....	2,000	*Penn Grove.....	300	Total.....	1,288,218
*Glen Ellen.....	500	*Petadama.....	5,500		

Unmarked—Electricity only.

—Gas only.

—Gas and Electricity.

—Gas, Electricity and Water.

—Gas, Electricity and Street Railways.

—Electricity and Water.

—Electricity supplied through other companies.

—Gas supplied through other companies.

—Water supplied through other companies.

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OPERATES 10 hydroelectric plants in the mountains,
4 steam-driven electric plants in big cities,
17 gas works.

SERVES $\frac{1}{4}$ of California's population.

30 of California's 58 counties.
An area of 37,775 square miles,
 $\frac{1}{4}$ the size of New York State
 $\frac{1}{2}$ the size of all the New England States combined.

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PACIFIC SERVICE MAGAZINE



CALIFORNIA BUILDING AT THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION

Vol.
6

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No.
12

Published Monthly by the Pacific Gas and Electric Co., San Francisco, Cal.

The Pacific Telephone and Telegraph Company

GOOD SERVICE AT FAIR RATES

Reports

Construction

Designs

J. G. White Engineering Corporation

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Pacific Service Magazine

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Contents for May

THE COLLECTIVE GAS EXHIBIT AT THE EXPOSITION	<i>Frontispiece</i>
THE PLACE OCCUPIED BY GAS AT THE PANAMA-PACIFIC EXPOSITION	<i>E. C. Jones</i> 399
NEW JONES OIL-GAS PROCESS NOW IN OPERATION	406
THE "HOME ELECTRICAL"	407
AUTHORIZED ADDITIONS AND IMPROVE- MENTS	411
WELCOME, MEMBERS OF THE N. E. L. A. WELCOME!	<i>"Pacific Service"</i> 412
DOINGS OF "PACIFIC SERVICE" SECTION, N. E. L. A.	<i>E. B. Price</i> 415
"PACIFIC SERVICE" SECTION—IN RETRO- SPECT	<i>Henry Bostwick</i> . 116
THE FINANCIAL SIDE OF "PACIFIC SERV- ICE"	<i>A. F. H.</i> 419
BATTLING WITH FLOODS NEAR COLUSA	<i>P. M. Downing</i> . 422
EDITORIAL	424
DEFINITE VOLTAGE OR DEFINITE TIME SETTING FOR RELAYS	<i>Thos. E. Fogalsang</i> 426
TIDINGS FROM TERRITORIAL DISTRICTS	428
OAKLAND BOYS SOME BALL-TOSSERS—Ad- MITTED BY A SAN FRANCISCO EXPERT	432

Index to Advertisers

Alexander Hamilton Institute	x	Pierson, Roeding & Co.	iv
Allis Chalmers Mfg. Co.	ii	Rochling's, John A., Sons Co.	v
Associated Oil Co.	iii	Schaw-Butcher Co.	vii
Bombright, William P. & Co.	i	Sprague Meter Co.	iii
Byron Jackson Iron Works	vi	Standard Underground Cable Co.	vii
Chaplin-Fulton Mfg. Co.	vi	Steiger & Kerr Stove & Foundry Co.	v
General Electric Co.	viii	Wagner Electric	vi
General Gas Light Co.	ii	Westinghouse Electric & Mfg. Co.	ix
Halsey, N. W. & Co.	11th page cover	Welshbach Company	iii
Jolene-Manville, H. W., Co.	v	White, J. G. Engineering Corporation	2nd page cover
Pacific Telephone & Telegraph Co.	2nd page cover	Wood, R. D. & Co.	iv
Patrick & Co.	vii		
Pelton Water Wheel Co.	vi		



The Collective Gas Exhibit installed in the Palace of Manufacturers at the Panama-Pacific International Exposition.

The Place Occupied by Gas at the Panama-Pacific Exposition

By E. C. JONES

THE other day a visitor to the Collective Gas Exhibit in the Palace of Manufactures was casually looking at some of the latest successes in incandescent gas lighting, and an attendant offered to explain the economy and efficiency of the lights.

The stranger remarked: "Is it possible that you gas men are trying to stay the hands of progress by postponing your extermination by electricity?"

The attendant replied, "Why! Gas is used to warm the hands of progress."

The gas industry is very near the head of the list of the great purveyors of comfort and convenience to the public, and the use of gas for cooking, heating and lighting throughout the Panama-Pacific Exposition when considered in connection with the most complete Collective Gas Exhibit in the Palace of Manufactures, brings gas into its own.

In a beautiful pavilion at the north end of the Palace of Manufactures are gathered together the results of the latest developments in the uses of gas. The exhibits are artistically arranged and presided over by competent demonstrators, and visitors may follow the gas business from the crude materials from which gas is made to the ultimate rendering of brilliant light rays which combine efficiency and economy in illumination.

The lighting effects of the exhibit are provided by the Welsbach Company and the General Gas Light Company. The Welsbach Company has installed a bungalow in which are displayed the latest designs of semi-indirect lighting, and residence lighting is featured to emphasize

the artistic beauty, brilliancy and economy of incandescent gas-lighting.

The General Gas Light Company occupies a prominent corner space in which is displayed a complete line of the latest types of lamps, which it manufactures, and the mercury valve control for distance or ceiling lighting, also an excellent line of gas irons. Both of these exhibits make a feature of the evolution of the gas mantle throughout the different stages of the process of manufacture.

The Collective Gas Exhibit has demonstrated the fact that the best advertisement of gas for illumination is *light*.

The General Gas Light Company and the Welsbach Company came to the front with an offer to furnish all the necessary lighting fixtures, glassware and mantles for the complete equipment of the exhibit and the maintenance of these lamps.

When it is considered that the exhibit is lighted by 14 five-mantle arcs, 61 three, four and five-mantle semi-indirect fixtures; 80 bracket lamps; 8 inside arc lamps, and 14 outdoor single mantle lamps, which does not include the lamps on display by the Lindsay, Welsbach and General Gas Light companies, the generosity and "gas man's spirit" of this donation to the welfare of the industry may be appreciated.

The generous spirit of the exhibitors has been reflected in the attitude of the committee in its efforts to advance gas. The consumption of gas is about 20,000 cubic feet a day, and to encourage its use the committee decided to give free gas to exhibitors.

The Lindsay Light Company occupies



Triple Gas Saver exhibit.

a prominent central booth and displays the guaranteed mantles, and a number of types of residence lamps. An attendant is always present to explain the manufacture of mantles and to give advice in the matter of residence installations.

Everything modern and worth considering in the way of gas cooking and heating appliances is exhibited by the various manufacturers, including the American Stove Company, presenting the products of the Dangler Stove Company, George M. Clark & Company, the National Stove Company, New Process Stove Company, Reliable Stove Company, and the Ringen Stove Company; the Wm. M. Crane Company, New York; Detroit Stove Works, Detroit; Eclipse Gas Stove Company, Rockford, Ill.; Estate Stove Company, Hamilton, Ohio; Michigan Stove Company; Rathbone Sard Company, Aurora, Ill., and Trenkamp Stove Company, Cleveland, Ohio.

These appliance exhibits occupy 18 spaces or 2200 square feet of floor space, filled with the latest and most attractive

gas stoves. Demonstrators are in attendance and it is proposed to have special cooking lectures beginning May 1st and covering the entire field of the culinary art, to which gas cooking so readily and economically lends itself.

To avoid the placing of gas meters in each space, the gas is measured by two master meters forming an important exhibit in itself. The Industrial Instrument Company of Foxboro, Mass., furnished two four-inch orifice meters of a capacity of 3000 feet an hour each. These meters are nicely calibrated and are furnished with Foxboro recording gauges, making an interesting working exhibit.

The American Meter Company of New York exhibits the latest improvements in

gas laboratory apparatus, including photometers, calorimeters, and the different standards of light used in photometry.

Here may be found all the refinements of gas-testing apparatus, including nearly every type of meter, gauges and meter-provers.

One of the most interesting features of the exhibit is a working model



East entrance.



Welsbach exhibit.

of a station meter made of glass and showing at a glance the operation of that instrument which is so hard to explain even with the assistance of the best drawings.

The cheapness of gas is nicely demonstrated by a stand of 20 gas burners, each consuming five cubic feet of gas an hour, connected to a penny prepayment meter so arranged that by dropping a cent into the meter the 20 gas lights are turned on, and invariably with the result that one is impressed by the large amount of light obtainable for the small amount of one cent. This entire exhibit reflects great credit on an old

and well known concern that has sent its best products to California.

Among other exhibitors of gas meters are the Metric Metal Works of Erie, Pa., displaying new style five-light iron case meters and different sizes of the Tobey meter so generally used for measuring natural gas.

The Sprague Meter Company of Bridgeport, Conn., has a very interesting ex-



Paraffine Paint Company exhibit.

hibit of the Sprague cast iron meter, and one of the unique features of this exhibit

is a manifold made of steel pipe in which all joints are welded by the oxy-acetylene welding process, and to this manifold are connected twenty-one No. 1 Sprague meters.

The Hoffman Heater Company of Lorain, Ohio, occupies two



Section of American Stove Company exhibit.

prominent spaces in the center of the exhibit and has on display a full line of water heaters which it manufactures. The Hoffman was officially selected for hot water service at the Panama-Pacific International Exposition, and 57 of these heaters are in use in the different buildings on the grounds. This company has a working exhibit with demonstrators constantly in attendance to show the good qualities of the water heaters and steam generators. The broad-mindedness of the exhibitors is shown by the exhibits of coal, coke and the different by-products, as well as retorts for making coal gas, models of benches and coke



S. R. Dresser Manufacturing Company.

ovens. This would seem to an outsider like an invasion into a territory where oil is king, but when it is considered that the Exposition is the world's meeting place in 1915, and that the efforts of exhibitors at the Collective Gas Exhibit have

containing samples of nearly all the by-products of coke-making from bituminous coal. In the center of the exhibit is a large plate-glass cube representing 31 cubic feet of available gas remaining from the coking of 10 pounds of coal,

and within this crystal cube there is another cube of coal weighing 10 pounds, and placed around this coal are 7.38 pounds of coke and the exact quantities of the ammonium sulphate, tar and benzole produced from 10 pounds of coal. This is an ocular demonstration which amounts in the ordinary mind to a revelation of the valuable materials obtained from the distillation of coal.

The H. Koppers Company of Pittsburg, Pa., has an attractive exhibit, including a model of its latest coke oven with the plans and photographs of coal plants

and installations of Koppers ovens with the recovery of by-products.

Interesting features of this exhibit are two glass cases, one containing exactly one ton of coal and the other the amount of coke yielded by a ton of coal, which is approximately 1500 pounds. This exhibit also contains nicely displayed samples of by-products obtainable from a ton



Industrial Instrument Company.

already been richly rewarded by sales in South America, Australia and the different countries of the Orient, the wisdom of these exhibitors is explained.

The classification covering gas exhibits is the first in the history of expositions that has permitted the entering for awards of the material from which gas is made and of the gas itself. This has materially added to the interest of the Collective Gas Exhibit in many ways.

The Consolidation Coal Company of Baltimore, Maryland, exhibits a large block of Elkhorn gas and coking coal, 30 inches square and over 5 feet in height, weighing about 1500 pounds. Different grades of coke are also on exhibit and a number of pictures of the Elkhorn mines and the mountaineers' homes in the Elkhorn coal fields.

Coke ovens and their products are exhibited by the Semet-Solvey Company of Syracuse, N. Y., in a handsomely furnished booth,



Davis-Bournonville Company exhibit.

of coal, and on the table is a small gas lamp so adjusted that the gas from a ton of coal will operate it continuously for 2000 hours.

The Parker-Russell Mining and Manufacturing Company of St. Louis, Mo., ex-

able and marks the progress of refinement in gas machinery.

The P. David Company of San Francisco shows samples of castings which are a credit to California. These include specially constructed manholes and covers particularly adapted for gas,

electric and steam manholes, as well as a line of grate bars, the excellence of which has brought this company prominently to the front. The appearance of acetylene on the gas man's horizon some years ago seemed as though a competitor was in the field, but acetylene dropped into its niche of usefulness and is now indispensable in welding gas pipes and the innumerable uses in making fittings and repairs in gas manufacture and distribution.

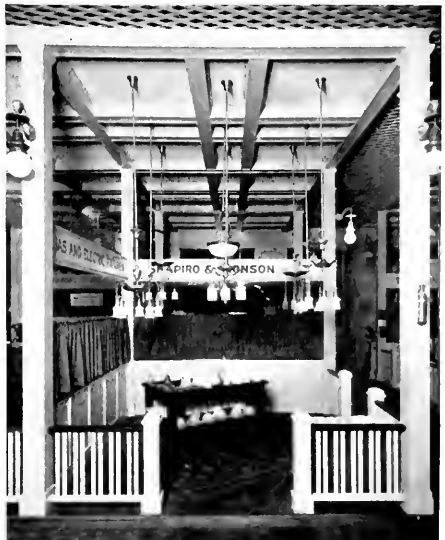
The Davis-Bournonville Company of New York has an interesting and extensive exhibit of oxy-acetylene appliances, including an Oxygraph which cuts steel to several inches in thickness following



American Stove Company.

hibits a very complete model of its latest development in full depth regenerative coal gas benches of ten retorts. This model is mounted on a stand and different colored ribbons lead from the essential parts of the bench to an index card fully explaining the name and use of each part. This company also exhibits retort ends and samples of sectional silica retorts, and the excellence and good quality of the material and workmanship demonstrates that coal gas has kept in the front rank in the development of the industry.

One of the best displays of gas machinery that has ever been exhibited in an exposition is made by the Western Gas Construction Company of Fort Wayne, Ind. This exhibit includes valves and sections of valves, sections of the ammonia washer and other apparatus featured by this company. There is also a working exhibit of an oil spray designed for introducing oil into water gas apparatus. The exhibit is credit-



Shapiro and Aronson fixture exhibit.

almost any design. In addition to this there is a Radiograph for cutting armor and other plates. Besides a display of welding, cutting and other torches, there is also an interesting exhibit of the work done, consisting of full-sized samples of gas-main welding, and welded fittings, and many photographs of the work performed by the oxy-acetylene torch. The fact that this is a gas exhibit and not an exhibit of any particular kind of gas is exemplified by the presence of lighting and pressure acetylene generators, stoves and lamps in operation.

The Oxweld Acetylene Company of New York has an interesting and extensive exhibit of its acetylene generators and a full line of cutting and welding torches attractively displayed on velvet covered frames.

The Union Carbide Sales Company and the Linde Air Products Company occupy adjoining sections in which are displayed a pyramid of packages of calcium carbide of the various sizes, and a complete line of oxygen tanks.

The new and economical use of gas by surface combustion is demonstrated in the exhibit of Rathbone, Sard & Company of Aurora, Ill., in a space fully equipped with different types of surface combustion broilers and room heaters. These appliances are thoroughly demonstrated and are attracting deserved attention.

The P. H. and F. M. Roots Company of Connersville, Ind., has shown its usual progressive spirit by exhibiting the best

products of its factories. The exhibit includes one of the company's latest Improved Gas Exhausters and Engine, a Vacuum Heating Pump for providing circulation in heating buildings, a small Vacuum Cleaning Pump and an Acmé

Power Blower used for revivifying purposes. These attractive machines are explained by an attendant, and the enterprise shown in the exhibit should be rewarded by an enlarged market for these time-proven machines.

The Paraffine Paint Company of San Francisco exhibits a model gas plant including the gas works and distributing system, thus giving an opportunity to show the different paints which the company manufactures, and the different parts of the plant to which they are best suited.



Eight Humphrey lamp fixture, central dome.

This is a very attractive method of displaying paint and its uses, and is a convincing argument in favor of the colors selected for the various pieces of apparatus. This concern has catered to the needs of gas companies for many years with deserved success.

The Reynolds Gas Regulator Company of Anderson, Ind., has on display a complete line of its gas-regulators attractively arranged on a cloth-covered raised platform. This splendid exhibit of regulators seems to feel at home in a land where much of the pioneer work in gas distribution was done, and where regulators are an indispensable part of every installation.

In connection with high pressure dis-

tribution the S. R. Dresser Manufacturing Company of Bradford, Pa., exhibits a line of all steel couplings with gaskets and accessories attractively arranged, and so placed that they can be readily inspected and demonstrated. These goods need not feel lonesome in the gas exhibit because they are surrounded by thousands of Dresser couplings used in the high pressure gas lines in California.

Shapiro and Aronson of New York present an attractive array of modern gas fixtures and glass ware displayed to the best advantage. The design of these fixtures embodies the lightness and grace of the best electric fixtures and gives an artistic setting to modern gas lighting.

The Safety Gas Main Stopper Company of New York occupies a space equipped with a full line of Safety Gas Main Stoppers, a number of which are placed in various sized pipe showing the manner in which they are used.

Among the exhibits which excite most favorable comment is the display of pressure gauges, regulators, special valves, and the Connelly Automatic Governor

made by the Connelly Iron Sponge and Governor Company of New York. There is also on exhibit a quantity of Connelly's Iron Sponge so generally used in



P. H. and F. M. Roots Company.

gas purification, and a large number of Jones Jel Photometers used for indicating the candle power of illuminating gas.

The Hugo Manufacturing Company of Duluth, Minn., makes a creditable display of various sizes of the Hawks Radiators.

The Safety Gas Lighter Company of Haverhill, Mass., displays all types of lighters for both gas and gasoline appliances, and has an attendant in charge to explain these useful little essentials to a complete gas kitchen.

The Triple Gas Saver Company of Sacramento, Cal., exhibits an ingenious device for economizing the use of gas during the cooking operations on ranges or hot-plates.

Full justice cannot be done to the large number of exhibits in the



The Hoffman Heater Company exhibit.

Collective Gas Exhibit in a single article without trespassing upon the patience of the reader, and any exhibits which have been overlooked, as well as those exhibits which are now in transit, will be fully described in a future article.

The Collective Gas Exhibit is educational and inspiring and does credit to those who have labored so hard for the welfare of the gas industry.

One of the most important and best deserved victories for gas at the Exposition was the installation of nearly 300 high-pressure gas-lamps of approximately 1100 candle-power each, placed on ornamental posts along some of the principal avenues of the Exposition and throughout the States and Nations sections of the grounds. These high-pressure lamps have also been placed on the top of kiosks in the grounds, thus mixing gas and electric lighting throughout the grounds without detriment to gas.

The credit for this remarkable and epoch-making display of street illumination is due to the Welsbach Street Lighting Company of America, which at great expense and much sacrifice made the installation to demonstrate the merits of gas where light is needed.

The Zone, which is the playground of the Exposition, is lighted by gas arcs concealed in ornamental lanterns suspended in groups of two on special standards, and extending the entire length on both sides of the Zone. These lights were furnished by the General Gas Light Company and hold their own against the most brilliant electric installations. Everywhere throughout the Panama-Pacific Exposition gas is used for cooking, water-heating, and warming the air of rooms; and, to repeat, it seems that gas has come into its own, out here in California where everything is measured by its worth.

New Jones Gas-Oil Process Now in Operation

Due directly and indirectly to the Panama-Pacific International Exposition, the increased consumption of gas has demanded an increase in gas-generating apparatus. A most important installation was recently completed at the Potrero Works, San Francisco, where two improved Jones Oil-Gas Sets are now adding their quota to the daily output.

These sets have a diameter of 18 feet 9 inches, the primary generator being 49 feet high and secondary generator 63 feet high, with a rated capacity of 5,000,000 cubic feet per day per set. This new installation is of such enormous importance to the scientific world that it is proposed to write of it fully in a future issue of PACIFIC SERVICE MAGAZINE; at this time it may suffice to inform our readers that in this new process, invented and

patented by Mr. E. C. Jones and his son, Mr. Leon B. Jones, the control of the apparatus has been so condensed, so simplified, that the amount of labor required to operate it has been reduced to one man. Furthermore, the improved Jones apparatus not only effects better economies in operating but accomplishes increased efficiency in the use of oil, almost entirely eliminating the carbon by-product. In the early days of oil-gas manufacture the proportion of lamp-black to gas ran as high as 50 pounds to the 1,000 cubic feet; but by the new Jones process the carbon by-product is reduced to a negligible minimum of about 4 pounds.

A set of the same size and style as those installed at the Potrero is being added to the generating plant in Oakland gas-station "B," Alameda County District.

The "Home Electrical"

BY far the most interesting as well as most popular electrical exhibit at the Panama-Pacific Exposition, and one which demonstrates most strongly the great strides electricity has made in the improvement of living conditions in our

Mission type California home, completely furnished in perfect taste, in which no detail of appointment has been overlooked.

The veranda is generously lighted with Mazda lamps in suitable fixtures and an



The "Home Electrical," in the Palace of Manufactures, Panama-Pacific Exposition.

homes, is the "Home Electrical," the exhibit of the General Electric Company in the Palace of Manufactures.

In the Home Electrical is shown, as never before, how every household duty can be made one of pleasure and comfort through the use of some electrical device, generally no labor other than the turning of a switch being necessary. The old time drudgery, discomforts, and unpleasantness attendant upon manual labor and the "before electricity" appliances are forgotten and the up-to-date home is now at all times shown to be a haven surrounded by comfort and economy.

The Home Electrical itself is a pure

electric bell button is seen at each door.

In the living room instead of the old-fashioned wood fireplace, with its accompaniment of dirt and labor, is an electric mantle-type luminous radiator, giving warmth and cheer. Here also, the unused piano is transformed into an instrument of pleasure through the medium of the Electrelle, the latest development in electric player attachment. Mazda lamps, in semi-indirect ceiling fixtures and wall brackets, furnish a soft and pleasing illumination.

Adjoining the living-room is the dining room, similarly lighted, heated with a portable luminous radiator and re-

freshed with a small electric fan. On the dining table is a complete set of appliances for a quick, light meal, connected to a four-gang receptacle, so that all may be used at one time. There is the radiant

Between the dining room and the kitchen is the butler's pass pantry. In it is installed a combination butler's sink and dishwasher for cleaning the light and valued wares. On a shelf there is a disc stove for making dressing and sauces, and a small electrically driven buffer for polishing the nickel and silver pieces. On the wall is the annunciator of the door bell system signaling for the quick information of the maid or butler. Mazda lamps give a strong but comfortable light.



The living room in the "Home Electrical."

toaster, coffee percolator, tea samovar, and disc stove for chocolate, the uni-set chafing dish for warming soups and broths or preparing a warm dessert, and the radiant grill for broiling chops, toasting bread or preparing eggs. At one side of the dining room is the "breakfast nook," easily arranged and equipped with "at-the-table" appliances. This feature is both pleasing and unique as it makes the breakfast room not only a part of the dining room, but also one side of a small vine-covered open-air patio, filled with ferns and flowers, and a trickling spring. One other unique feature of the dining room is a warming closet at the entrance to the butler's pantry, where food is kept warm for the next courses. This is heated by electrical units.

take away the bugaboo of "my own work." Then there is the R-3 type of domestic range, with its many variations of cooking heats, large cooking capacity, raised oven, and auxiliary broiling grill. In place of the old-time water back in the range a circulation water heater connected to the usual water tank insures an



The electrical bedroom.

immediate and constant supply of hot water. A rib-slice or multiple toaster and large coffee-percolator make a second convenient addition to the kitchen equipment, as they can be easily watched while the cooking is being done. On the table also is a utility grill which so often fills in between the broiler and oven for quick grilling.

The unpleasant odors of cooking are no longer noticed, as a household ozonator and exhaust fan combine to quickly remove them and keep the air in the kitchen pure and fresh. Should the day be chilly, a serviceable air heater can be put into service by inserting a small wall plug. A new device to quiet the worry and complaint about the late arrival of the iceman is the electrically lighted and cooled refrigerator, on the side wall, operating in combination with the refrigerating apparatus located in a small closet. There is also an electrically driven ice cream freezer in the kitchen, if homemade ices and creams are preferred. A connection

with the inter-house phone for saving steps is the final convenience.

In the bedroom, milady finds a vibrator for massaging, curling iron, hair dryer, boudoir lamp and mirrolite as the neces-



The electrical kitchen.

sary conveniences of her toilette. A warming pad and small water heater, together with a luminous radiator are especially appealing on cold nights, although a fan is ready should the weather change. A sweeper type vacuum cleaner and interhouse and main line phone connections do their share to cut down the

tiring duties and steps. But the master stroke in the bedroom is the burglar switch, which, when pressed, lights every lamp in the house. The intruder can have no dark place in which to hide, as the master switch makes it impossible to turn the lights off.

The children have been provided for in the nursery with electric toys, crib and constantly fresh air from a Sirrocco window set. This window set is installed in the



The electrical laundry.

window opening, outside of the house, to exhaust the used air and draw in fresh without creating a draft. An all-night light, using very little current, gives sufficient yet subdued illumination. A hot water heater, twin-glower radiator, and uni-set nursery outfit take care of the little aches and pains, and a heating pad warms up cold hands and toes. A light, portable vacuum cleaner teaches them an early lesson in cleanliness and house-keeping.

The bathroom is finished in white tile and porcelain. In addition to a complete set of bathroom fittings in porcelain, a hot water cup, twin-glower radiator, electric vibrator and hair dryer, and mirrolite add their comfort. An exhaust fan and household ozonator prevent impure or vitiated air, and draw the steam from the hot water out of the room immediately, with the aid of a small oscillating wall fan. The hot water for the shower bath is drawn from the hot water tank in the kitchen, as well as that for the tub and wash-stand.

One pleasing and restful note throughout the entire house is that the electrical equipment of each room, though very complete, is, like the other furnishings, particularly suited to that one room. One does not wade through a maze of miscellaneous devices, but in passing through each room finds everything essential and in perfect taste. The home as it is, is just as any home would be if equipped throughout with usable electrical devices and appliances.

The sewing room is the envy and delight of all housewives, with its appliances for easy mending, repairing or clothes making. The sewing machine is operated by an electric motor controlled by the foot treadle. The control of this motor is so fine that the machine may be stopped half way through a stitch, though the machine can be used for sewing quarter-inch leather. The motor is concealed under the machine board, so that none of the valuable surface space is wasted. A three and a six pound elec-

tric iron are located on a convenient board, and a small portable vacuum cleaner is used to pick up threads and scraps of cloth without effort. A connection to the interhouse phone saves many steps in tending to various household duties, and a small air heater and fan stand ready for their special work.

The laundry contains every appliance, electrically operated, which is necessary for home laundering. There is a quiet running washing machine, and an electric mangle, which may be entrusted with delicate pieces; three, six, eight and twelve pound irons for any ironing which may need to be done; and a double eight-inch hot plate for heating water for the machine. A collapsible ironing board folds into a shallow closet and the flat iron switch is equipped with a pilot light to indicate whether the current has been turned off. An air heater and exhaust fan provide comfortable working temperatures under all conditions.

Provision has been made, in the shed, for constant water pressure all over the house, when the water supply is the well. Here is installed an automatic air pressure system connected to the water supply, keeping the pressure constant at any desired point.

The man of the house has his inning in the workshop and garage. The shop is equipped for any repair or building work, with a work bench, bench type drill press, chipping hammer, electric riveter and grindstone. Then there is a buffing outfit, saw table, bench type lathe, and metal melting pot, all electrically operated. Handy little electric soldering irons and an electric glue-pot aid in the repair of leaky utensils, or broken woodwork. An air heater of sturdy build and generous capacity is ready at all times to insure comfort in the shop.

"We take care of our own car now since the dependable electric appliances came out," is the slogan of the garage. An electric coupe in the garage is charged from a mercury arc rectifier, or a mechanical rectifier (motor-generator set)

according to the likes of the car owner, and the lighting batteries are charged by a small vibrating rectifier installed on a convenient shelf. A small portable search lamp, which can be operated on any electrically lighted car, is used for close examination of any part of the car, and a portable electric tire pump completes the car equipment. Connections are made to the inter-house phone in both garage and workshop and save many trips and much time. An air heater is also installed in the garage.

One auxiliary room of particular interest to those of rural communities or of large places, is the dairy. Here there is an electrically-driven cream separator, bottle washer and churn to reduce manual labor to an absolute minimum. In conjunction with these appliances is an automatic refrigerator and milk cooler, operating to keep the temperature of the cooling chamber at the proper point. At

any time that the temperature varies from the desired point, the thermostat control operates the motor switch and starts the flow of cooling solution through the pipes. When the temperature has dropped to the proper point, the thermostat control again operates to stop the motor.

Every device or appliance mentioned as being in the Home Electrical is electrically operated, and whenever practical, is arranged for automatic control. Typical and up-to-date methods of wiring are illustrated in the home, and auxiliary outlets on walls and baseboards are installed to show the great flexibility of electricity for household use. So easily does electricity adapt itself to such use that the complete array of appliances, lighting fixtures and labor-saving devices, simply add to the wonderfully pleasing air of the home and combine to create the desire to stay there indefinitely. The exhibit is perfect in every detail.

Authorized Additions and Improvements

Alameda County District.—\$11,287.00. Installation of a Cummer dryer for use in conjunction with tamp-black filtering system, Station "B," Oakland.

Drum District.—\$5,000.00. Replacing Girard turbine with impulse type wheel at Alta power-house. This turbine is now out of commission, and must be rehabilitated in order to utilize the water, and be available in case of accident to other unit.

Petaluma District.—\$12,012.00. Replacement of 5 miles 2-inch high pressure gas-main between Santa Rosa and Petaluma. Present line is heavily overloaded and requires very high pressure, which causes excessive leakage. Estimated reduction in cost of operation, \$2,000 per annum.

Redwood District.—\$8,440.00. Installation of three 500 K. W. transformers at substation of Pacific Coast Steel Company, South San Francisco.

Sacramento Railway.—\$12,805.20. Reconstructing P street from Third to Tenth, distance 2,186 feet, with single track, replacing 10-pound T rail. Necessary because street is to be paved with asphalt.

Sacramento Railway. \$10,926.00. Reconstructing J street from Second to

Twelfth, distance 3,920 feet, with 87-pound groove rail to replace 51-pound rail. Present track reconstructed in 1893 and is badly worn, causing expensive maintenance.

Sacramento Railway.—\$18,406.85. Reconstructing 60-pound T rail with 87-pound groove rail and building a new track running parallel from Stockton avenue on Second avenue to East avenue, thence on Park avenue to Thirty-fifth street, distance 1,724 feet. Streets are to be paved with asphalt.

San Francisco District.—\$50,504.25. Installation of high pressure gas main for peninsula, from Potrero to county line, distance 31,500 feet, of 8-inch welded steel pipe. This main is absolutely essential to insure adequate supply to peninsula, and to prevent excessive leakage of gas in present line.

San Francisco District.—\$11,400.00. Installation of two 822 h. p. boilers and superheaters at Station "A," to enable plant to carry load equal to installed capacity of turbines.

San Francisco District.—\$1,078.40. Installation of 93 gas lamp-posts, Broadway and Webster, Pacific between Laurel and Locust.



Native Sons' Hall, in San Francisco, where the National Electric Light Association will hold its 1915 convention.

Welcome, Members of the N. E. L. A., Welcome!

IN behalf of the electric light and power industry on the Pacific Coast, "Pacific Service" extends the hand of welcome to the members of the National Electric Light Association who will attend the thirty-eighth annual convention of the Association to be held in San Francisco during the week of June 7th to 12th.

The National Electric Light Association is the greatest and best representative organization of its kind in this or any other country. Its membership of 15,000 embraces every branch of electrical enterprise, under the leadership of the great central station industries of the country which represents millions upon millions of invested capital, are enormous employers of labor and have been most prominent factors in shaping legislation throughout the country for the regulation of public utilities along proper lines. Its annual conventions are attended by men who are among the brightest minds in the electrical world and the records of



Holton H. Scott, of New York, president
of the N. E. L. A.

their proceedings have proven of inestimable value to the progress and development of the electrical industry everywhere.

For the second time in its history this Association comes to the Pacific Coast for its annual convention. San Francisco, by reason of its Panama-Pacific International Exposition, is naturally the great convention city for 1915. It is felt, however, that the Pacific Coast possesses attractions for the electric light and power men of the country other than those of its Exposition City: for, out here along the shores of the great Western ocean have the greatest strides in the development of hydro-electric power been made, the greatest achievements in the long-distance transmission of electric energy along high-tension wires. In welcoming, there-

fore, the members of the N. E. L. A. to the city by the Golden Gate the electric light and power men of the Pacific Coast feel a special pride in the knowledge that their section of this great country has contributed at least something worth while to the development of electricity as a factor in the world's progress. It is hoped that much of real advantage to the common cause will result from the deliberations of this 1915 convention. And so, members of the N. E. L. A., once more WELCOME!



T. Commerford Martin, of New York, secretary of the N. E. L. A.

DOINGS OF "PACIFIC SERVICE" SECTION N.E.L.A.

CHRONICLED BY ERNEST B. PRICE

The April meeting of "Pacific Service" section was held on the evening of Thursday, the 27th ult., at Native Sons Hall, San Francisco, and was devoted to an exploitation of the part played by the San Francisco district in the "Pacific Service" scheme of things. Mr. Geo. C. Holberton, manager of San Francisco district, presided and the faithful turned up in such numbers that the hall was taxed to its utmost capacity, many late comers being unable to obtain seats.

Chairman Stanley V. Walton called the meeting to order and then turned it over to Mr. Holberton, who, in his opening remarks, expressed the hope that it might be interesting to all members of the section to know just what part of the whole "Pacific Service" system, San Francisco district, played, how its work of supplying "Pacific Service" to the entire city of San Francisco, not forgetting the Panama-Pacific International Exposition, was performed, how this business had been brought about and what it meant; all this with the idea of possibly suggesting to some of the other districts a way to increase their activities. He then proceeded to review the radius of the company's activities in San Francisco, covering the fields of both gas and electricity. An interesting feature of his lecture was an exhibition of lantern slides depicting the gas distribution system and the high pressure system of welded pipe installed at the Panama-Pacific Exposition. Mr. Holberton passed in review the many varied industries within the city limits which are operated by gas or electricity or both and made a special point of the fact that in almost every instance "Pacific Service" is relied upon to the exclusion of any auxiliary plant or service; in a word, that owing to the flexibility of our company's system our consumers have perfect confidence in its ability to give continuous and reliable service.

Another feature of Mr. Holberton's lecture was his illustration of the development of the industrial gas field. He demonstrated, with the aid of lantern slides, the almost universal application of gas as fuel, to the displacement of coal, fuel-oil and wood, in a wide range of commercial activities.

Mr. Holberton also described the modern electric meter installation. He stated that a move in the right direction had been made in the attempt to standardize electric meter installations. In the past, he said, the company had been subjected to considerable trouble and expense in rectifying errors of contractors; but under the present system drawings for meter installations were incorporated in the general plans of the building, with the result that trouble and delay due to incorrect location had been practically eliminated.

Mr. Holberton was followed by Messrs. H. P. Pills, Industrial Engineer, and D. E. Keppelmann, Superintendent of Gas Distribution in San Francisco, who described the work pertaining to their respective departments. It was a most instructive evening and went far to give the members of

"Pacific Service" section an idea of the scope and magnitude of the activities of the San Francisco district. At its conclusion a rising vote of thanks was tendered Mr. Holberton.

An interesting and instructive meeting was held under the direction of the Claims Department on Friday evening, April 13th. Mr. J. P. Coghlan, manager of the department, read a paper dealing with the "Safety First" movement. In calling attention to the work which is being carried forward by our company in the direction of accident prevention, the speaker described the system of safety committees and their work, and in summing up stated that accident prevention was a matter of education and co-operation rather than devising safeguards and making hard and fast rules. To be effective it must have the eye and mind of the workman as well as the eye and the mind of the superintendent or manager, and when conducted so as to bring both into play, it not only prevented injury, pain and financial loss, but it developed interest and efficiency and brought about wholesome relations between the men who do the work and those who direct it.

At the conclusion of Mr. Coghlan's instructive paper, a tabulation was shown giving the various classes of accidents and the percentage of each to the total number. Safety Inspector V. R. Hughes followed with a series of pictures pointing out conditions which produce accidents, and what had been done to remove these conditions.

ATHLETIC SECTION, N. E. L. A.

The Athletic Committee has been able, through the co-operation of the various managers, heads of departments, and employees, to collect the names of a large number of our men who are interested in one or more branches of athletics.

Before the June issue of the magazine goes to press, we will undoubtedly have some very interesting announcements to make.

"Pacific Service" Section in Retrospect

By HENRY BOSTWICK, Secretary of the Section

Before this issue of the magazine reaches the hands of our employees there will have been elected a new set of officers to take up the activities of "Pacific Service" section. At this time, then, it is fair to say that the affairs of the section have been admirably handled during the past year.

The aims and objects of the National Electric Light Association have been from time to time so vividly brought before the readers of the magazine that it is not our intention to dwell on them at this time, but we do wish to point out to our employees as a whole what has been accomplished by "Pacific Service" section. In the rustle and bustle of our work-a-day life it is well that we pause, as it were, to pick up loose ends and then continue on our journey; for, as has been so well and truly expounded, "To thine own self be true."

The membership of our section has now passed the five hundred mark, which is extremely gratifying to the officers, for it has proven that their

efforts have not been without avail. During the past year we have held two meetings a month; the first being the regular meeting, at which the general business of the section was transacted, and in connection with which it has been the endeavor of the officers to have a lecture or address on some topic of general interest. How well they have succeeded along these lines the following will best illustrate:

June 19, 1914. The first annual banquet of the section was held, at which the speaker of the evening was Dr. David Barrows, Dean of the Faculty of the University of California; subject, "Important Part Played by Organizations of the Character of 'Pacific Service' in the Upbuilding of the State."

July 10, 1914. The speaker of the evening was Hon. William J. French of the Industrial Accident Commission of the State of California; subject, "Workmen's Compensation and Safety Act."

August 14, 1914. Lecture on "Glacier National Park, Montana."

September 11, 1914. Lecture by Mr. Louis Levy of the Panama-Pacific International Exposition Company.

October 9, 1914. Lecture by Dr. Ng Poon Chew, Chinese journalist, scholar and statesman; subject, "The Birth of a Nation."

November 13, 1914. Lecture by the Rev. Dr. J. Nieto; subject, "A New Thought in the Problem Concerning the Relations Between Capital and Labor."

December 11, 1914. Midwinter jinks and vaudeville show by "Pacific Service" talent.

January 22, 1915. Joint meeting with the San Francisco chapter of the A. I. E. E. at which Mr. F. G. Baum presented a paper on "The Best Control of Public Utilities." At this meeting we were favored by having with us Secretary T. C. Martin of the N. E. L. A. and Mr. Geo. W. Elliott, Master of Transportation, who favored us with very interesting talks on subjects which are most dear to us, *i. e.*, N. E. L. A.

February 12, 1915. Lecture by Mr. Kiyo Sue Inui; subject, "America vs. Japan."

March 12, 1915. Descriptive talk by Mr. G. I. Kinney, of the General Electric Company, on the "Home Electrical" exhibit at the Exposition.

April 13, 1915. Mr. John P. Coghtlan, manager of the Claims Department, presented an extremely interesting paper on "Accident Prevention," in which he was assisted by our Safety Engineer.

So much for our regular meetings. Other meetings that presented food for thought were those held under the auspices of our several departments, and such meetings have enabled our members to become better acquainted with the broad scope of our organization, and what might be termed the guns behind "Pacific Service." At each of these meetings the respective heads of the departments acted as chairmen, and assisted by the men of their departments, took the members step by step through the working of their departments. The following should be an incentive for all of our members who have not been regular in attendance upon our meetings to be present hereafter; and to our employees who have not

availed themselves of the honored privilege of being affiliated with the section we would advise "Do It Now." Application blanks upon request.

July 24, 1914. Commercial section meeting. *L. H. Newbert, chairman for the evening.* R. E. Fisher, "Activities of the Commercial Department." Frank Talcott, (paper) "New Business Methods, San Francisco District." Burdette Cornell, "Competitive Conditions in Oakland." L. F. Galbraith, "Possible Methods of Increasing Load on Existing Lines."

August 24, 1914. Steam section meeting. *F. H. Varney, chairman for the evening.* F. W. Small, (paper) "Crude Petroleum." E. A. Rogers, (paper) "Steam Power Plant Efficiencies." H. P. Pitts, "Experiences with Domestic Steam Consumers."

October 2, 1914. Electric Distribution section meeting. *S. J. Lisberger, chairman for the evening.* C. J. Wilson, (paper) "Methods of Distribution" (lantern slides). F. C. Piatt, (paper) "Costs of Electric Service" (lantern slides). A. U. Brandt, (paper) "Voltage Regulation" (lantern slides).

October 23, 1914. Auditing section meeting. M. H. Bridges, (paper) "History of Accounting." Description of accounting methods in use by Pacific Gas and Electric Company (lantern slides).

November 27, 1914. Gas section meeting. E. C. Jones, "History of the Gas Business." L. B. Jones, (paper) "Gas Manufacturing" (lantern slides). D. E. Keppelmann, (paper) "Autogenous Welding and Gas Distribution" (lantern slides).

February 26, 1915. Hydro-electric section meeting. P. M. Downing, "General Layout of Our Hydro-Electric System" (lantern slides). Geo. H. Bragg, "Description of Water Wheels, Generators and Power Houses" (lantern slides). E. H. Steele, "High Tension Line Construction" (lantern slides). H. A. Laidlaw, "Substations and Substation Apparatus" (lantern slides). F. R. George, "Operation of Our Electric System Taken as a Whole; Work of the Load Dispatcher" (lantern slides).

March 26, 1915. Industrial Department meeting. H. P. Pitts, "Function of the Industrial Department." J. E. Van Hoosear, (paper) "Industrial Engineering and Its Relation to the Motor Load" (lantern slides). E. V. Daily, (paper) "Development of Gas as an Industrial Fuel" (lantern slides). E. Zimmerman, "Explanation of the Manufacture of the Incandescent Lamp."

April 27, 1915. San Francisco District meeting. Geo. C. Holberton, assisted by H. P. Pitts and D. E. Keppelmann, "How 'Pacific Service' Is Supplied to the City and County of San Francisco, the Exposition, St. Francis Hotel, Daily Newspapers, and Other Large Consumers." Stereopticon views of Company's property in San Francisco.

In closing, the officers of "Pacific Service" section wish to extend through these columns their heartiest thanks for the co-operation and assistance they have received from all departments, and also to our members who have served so well and faithfully on our several committees; for without such co-operation we would not at this time have been able to write in such glowing terms of the great work that we feel has been accomplished during the past year. We bespeak the same support for the new officers, and with your co-operation the success of their tenure of office is assured.

The Financial Side of "Pacific Service"

INCOME ACCOUNT—FIRST THREE MONTHS OF 1915.

Following is a statement of the earnings of the Company for the first three months of the current fiscal year, compared with the same period of the preceding year. It will be noted there was an increase of \$406,751, or 9.36 per cent in gross operating revenues and of \$326,939, or 14.84 per cent in net income (before depreciation), and that the balance after the payment of all fixed charges and amortization of bond discount and expense increased \$330,787, or 29.23 per cent.

LATEST EARNINGS—THREE MONTHS TO MARCH 31ST.

	1915	1914	INCREASES
Gross Operating Revenue.....	\$4,749,327	\$4,342,576	\$406,751
Deduct Maintenance, Operating Expenses, Taxes and Reserves for Uncollectible Accounts and Casualties.....	2,290,725	2,237,961	52,764
NET EARNINGS FROM OPERATION.....	\$2,458,602	\$2,104,615	\$353,987
Add profit on Merchandise Sales and other Miscellaneous Income.....	71,314	98,362	27,048 (Dec.)
TOTAL NET INCOME (before depreciation)....	\$2,529,916	\$2,202,977	\$326,939
Bond Interest.....	950,932	959,107	8,175 (Dec.)
Balance.....	\$1,578,984	\$1,243,870	\$335,114
Interest on One-year Notes and Floating Debt (Temporary).....	116,341	112,059	4,282
Balance.....	\$1,462,643	\$1,131,811	\$330,832
Bond Discount and Expense.....	36,958	36,913	45
Balance.....	\$1,425,685	\$1,094,898	\$330,787

*Including \$101,539 in litigation.

NEW BUSINESS FIRST THREE MONTHS OF 1915.

One of the most satisfactory features of the Company's current operations is the rapid growth in the number of its consumers. As will be seen from the following statements, the total number of customers on the Company's lines at March 31, 1915, was 386,032, a net gain, compared with March 31, 1914, of 32,402. The net gain in the first three months of 1915 was 8,123, as compared with a net gain of 4,096 in the first three months of last year. Should the present ratio of increase be maintained, the results for the year 1915 will largely exceed the very satisfactory showing which was made in 1914.

CONSUMERS SERVED BY THE COMPANY.

	DEC. 31, 1914	JAN. 31, 1915	FEB. 28, 1915	MAR. 31, 1915
Electric	148,957	149,852	152,233	153,731
Gas.....	220,360	221,483	222,036	222,830
Steam.....	337	341	353	352
Water	8,255	9,008	9,045	9,119
	377,909	380,684	383,667	386,032

INCREASES BY MONTHS.

Gain in January, 1915	2,775
Gain in February, 1915	2,983
Gain in March, 1915	2,365
Net gain in first three months 1915.....	8,123
Net gain in first three months 1914	4,096

GAIN IN CONSUMERS IN TWELVE MONTHS TO MARCH 31, 1915.

	MAR. 31, 1914	MAR. 31, 1915	GAIN IN 12 MONTHS
Electric	135,196	153,731	18,535
Gas	209,476	222,830	13,354
Steam	301	352	51
Water	8,657	9,119	462
	353,630	386,032	32,402

FINAL NOTE REDEMPTION.

Pursuant to a resolution adopted by the Board of Directors on May 5, 1915, the outstanding balance of \$1,500,000 of the Company's one-year 5 per cent notes maturing December 15, 1915, has been called for redemption on May 22, 1915. The payment of these notes will clear up the last vestige of the Company's floating debt, and will leave it without any short term obligations of any kind outstanding. The payment of these notes will also release \$7,000,000 par value of bonds pledged as security, namely, \$5,000,000 par value of General Lien 6's and \$2,000,000 par value of General and Refunding 5's. Of these the General Lien 6's, which were issued solely for the purpose of securing these notes, will be immediately canceled, the mortgage securing them satisfied of record and no bonds can, or will, ever again be issued under this indenture. The \$2,000,000 General and Refunding Bonds will be returned to the Company's treasury and the proceeds, when sold, will be available for general corporate purposes as these bonds were originally issued, under the authority of the Railroad Commission, to cover 90 per cent of the cost of extensions, additions and betterments.

CURRENT FINANCIAL CONDITION.

The current financial condition of the Company is extremely satisfactory and may be briefly described as follows:

All bills payable (amounting to \$1,394,968.27 on December 31, 1914) have been paid and advantage is being taken of all discounts for cash in the purchase of materials and supplies.

Including the \$1,500,000 5 per cent notes called for redemption on May 22, 1915, all of the Company's one-year notes, amounting to \$4,212,000 at December 31, 1914, have been paid.

After making provision for the payment of the final balance of one-year notes, cash on hand exceeds \$1,700,000 with about \$600,000 still due on preferred stock subscriptions on or before October 15, 1915. It is not believed that any new financing will be necessary until well beyond the first of next year although the Company expects to continue the sale of its First Preferred 6 per cent Stock to investors living within the territory covered by its operations, solely in pursuance of its policy of having its customers acquire a proprietary interest.

"PACIFIC GAS AND ELECTRIC CO.—A CALIFORNIA CORPORATION."

As will be noted from another table appearing in this number, \$24,030,000 par value of the Company's stock, being 46 per cent of all of its issued and outstanding share capital, is now owned by 4,535 stockholders resident in California. The average holding of these California stockholders is a little less than \$5,300. In point of numbers, they constitute 68 per cent of the total stockholders.

FIRST PREFERRED STOCK SALES.

From the date of the initial offering on June 3, 1914, to April 30, 1915, a period of eleven months, 4,430 subscriptions, aggregating \$9,895,200 have been received for the Company's new issue of First Preferred 6 per cent Cumulative Stock. Of this amount \$6,039,600 (60 per cent) was taken by stockholders under the original offering and \$3,855,600 (40 per cent) has been subscribed for by employees, customers of the Company, and others.

The growing appreciation among investors of this stock as a safe medium for securing an exceptionally good return on their money is reflected in the sales made since January 1, 1915, and it may be added that little or none of this stock has been sold outside of California, the Company having announced some time ago that it would limit sales to people residing within and contiguous to the territory served by it.

January, 1915, Sales.....	\$ 303,400
February, 1915, Sales.....	210,800
March, 1915, Sales.....	241,600
April, 1915, Sales.....	334,000
	<hr/> \$1,089,800

GEOGRAPHICAL DISTRIBUTION OF COMPANY'S STOCKS.

The geographical distribution of the Company's share capital as of April 30, 1915 (including all First Preferred Stock issued and subscribed for), was as follows:

WHERE OWNED	NUMBER OF HOLDERS	SHARES	PAR VALUE
In California.....	4535	240,304	\$24,030,400
On Pacific Coast outside of California....	48	6,743	674,300
Middle States.....	597	48,378	4,837,800
Eastern Coast.....	1058	183,195	18,319,500
Foreign.....	421	41,425	4,142,500
Total.....	6659	520,045	\$52,004,500

THE COMPANY'S BOND ISSUES.

Prevailing prices for the Company's various bond issues are a convincing indication of its excellent credit. With the exception of one or two issues, which may be said to be still on the bargain counter, its bonds are selling in the open market on about a 5 per cent basis.

Following are several of the factors, interesting in themselves, which have contributed to this high state of credit for the Company's secured obligations:

- The appraised value of the Company's properties (excluding all intangible values) is at least \$30,000,000 in excess of the total of all outstanding bonds. This equity, measured by current quotations on stocks outstanding, is approximately \$32,000,000.
- Net earnings in 1914 represent a margin of safety of 115 per cent over bond interest.
- In the nine years ended December 31, 1914, the net earnings of the Company, after bond interest, have aggregated \$25,896,652. Of this amount but 22 per cent (\$5,237,086) was paid out in cash dividends and the remaining 78 per cent (\$20,659,566) was reinvested in the property, applied in the reduction of funded debt or expended for other corporate purposes.
- On March 31, 1915, the various sinking funds of the Company held more than \$7,600,000 of retired bonds and cash and, by reason of these bond retirements, fixed charges have been reduced by approximately \$375,000 per annum.
- In the nine years ended December 31, 1914, the Company's expenditures for net plant additions (cost less value of property replaced) have amounted to \$11,248,730. During the same period the bonded debt of the Company increased by only \$30,434,400. The difference of \$10,814,330 represents additional security created over and above the par value of the bonds or, to state the foregoing a little differently, for every one thousand dollars of increase in bonded debt there has been an increase of \$1,350 in the value of the property securing these bonds. This margin of security exceeds the requirements of the most conservative of the so-called "equity clauses" appearing in public utility mortgages.

Undoubtedly the best bargain among the Company's bonds are its General and Refunding Mortgage 5's. These bonds are secured by a mortgage upon all the property and franchises of the Company and upon all future extensions and acquisitions, subject only to the lien of the underlying divisional bonds. We believe these bonds will have a substantial and permanent advance in price in the present investment revival, coupled with the constantly growing strength of the Company's position from a financial and operating standpoint.

Battling With Floods Near Colusa

By P. M. DOWNING, Chief Engineer O. & M., Hydro-Electric Section

THE control of the flood waters of the Sacramento is a question that has been given much study, not only by the engineers of the many reclamation districts along and adjacent to the river, but also by the national and state governments, and today the problem seems no nearer solution than it was many years ago.

A number of more or less comprehensive plans involving the construction of weirs, by-passes, etc., have been proposed by the different boards having control over such matters, and some work has been done; but as each year's high water brings with it greater damage and destruction there naturally arises in one's mind the question as to whether it will ever be financially possible to carry out any plan that will bring about the desired result, and still be agreeable to all interests involved.

The one point that seems to be agreed upon by everybody is that the natural channel of the river cannot by any system of levees be made to carry the flood waters. As matters now stand it is a case of the survival of the fittest. Property owners, or reclamation districts on

opposite sides of the river, are continually competing in their efforts to construct levees substantial enough to keep the water off their property. This, with the natural silting in the bottom of the channel, is each year raising the flood

water level; in fact, at many points along the river where twenty-five or thirty years ago levees two to five feet high were sufficient to hold back the water, they have been added to from year

to year, until today they are from ten to fifteen or twenty feet high.

During the winter of 1913-14 new high water marks were established at most of the gauging stations above Sacramento, but it remained for 1914-15 to establish the highest water mark ever recorded in this section. The very heavy storm of February 2d and 3d in Shasta and Tehama counties caused the river to rise very rapidly in the vicinity of Colusa, until, on February 4th, it had reached the highest known, with the result that a number of breaks occurred. One of these was a few miles above Colusa, two others a few miles below the same town, and another directly opposite Meridian.



Looking up river from top of Meridian bridge.



Looking west from Meridian bridge.



Looking along track between Meridian and Colusa.

These breaks allowed immense volumes of water to flow into the low-lands west of Colusa, Grimes and Knights Landing and flood more than 120,000 acres of land, much of which had already been sown to grain.

District No. 108, containing over 50,000 acres, and which had only recently installed a 4,000 h. p. pumping plant, was entirely flooded.

District No. 730, containing close to 5,000 acres, was also flooded, as was also a large amount of land not included in any reclamation district.

During this high water between sixty and seventy-five miles of this company's pole and tower line were in water from one to fifteen feet deep. The two breaks, a short distance below Colusa, occurred at a point where the 60 K. V. line running from Yuba City to Colusa was located not a great way from the levee; and, approximately, one mile of line was washed out.

At the Meridian break the west approach of the Northern Electric Company's bridge over the Sacramento was washed out, as was also one of the 125-foot masts carrying the 60 K. V. crossing span.

Between Meridian and Colusa, a distance of about seven miles, the entire country was flooded, and a number of miles of both Northern Electric and Southern Pacific companies' roadbeds washed out.

The town of Colusa was entirely isolated from the outside world, so far as railroad transportation was concerned.

The only means of ingress and egress to the place was by boat from Meridian; in fact, for quite a while the town was so surrounded by water that one could not travel more than a mile in any direction from the center of the town without getting into the flood water.

When the 60 K. V. line between Meridian and Colusa was washed out, Colusa was left in darkness, and on account of the high water it was impossible to make repairs. It was accordingly decided to lay a cable across the river at Princeton to connect from the Northern California Power Company's line at that place to the 11 K. V. line running between Colusa and the Moulton ranch.

To expedite the work, a steamer was chartered at Sacramento, loaded with the necessary men and material and started for Princeton. It had been planned to lay this cable by running it off the reel carried on the county ferry, but before we were ready to do the work the high water had wrecked the ferry, and the regular river boat had to be used.

Owing to the very high wind that was blowing at the time and the swift current in the river due to the high water, this was a very dangerous undertaking. In fact, at one time, when a particularly heavy gust of wind swept the boat broadside, the men threw off their slickers, fully expecting that the boat was going to be swamped.

However, no more serious accident happened than a slight damage to the lead sheathing of the cable that took only a few hours to repair.



View from east bank of river near the bridge.



River scene on morning of February 4th.

Pacific Service Magazine

PUBLISHED IN THE INTERESTS OF ALL EMPLOYEES OF
THE PACIFIC GAS AND ELECTRIC COMPANY

JOHN A. BRITTON - - - EDITOR-IN-CHIEF
FREDERICK S. MYRTLE - - - MANAGING EDITOR
A. F. HOCKENBEAMER - - - BUSINESS MANAGER

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The Pacific Gas and Electric Company desires to serve its patrons in the best possible manner. Any consumer not satisfied with his service will confer a favor upon the management by taking the matter up with the district office.

VOL. VI. MAY, 1915 No. 12

EDITORIAL

Visitors to the Panama-Pacific Exposition are greatly attracted by two exhibits that are a complete education in themselves. We refer to the Collective Gas Exhibit and the "Home Electrical" exhibit, both located in the Palace of Manufactures.

The Collective Gas Exhibit is the outcome of a suggestion put forward by the Pacific Coast Gas Association in discussing the outlook for 1915 and the advisability of securing the most attractive gas features for the Exposition, as well as the attendance of as many leading gas men of the world as possible at the Exposition city. No sooner had the project been launched than our Mr. E. C. Jones entered upon the work of arranging for an exhibit that in its comprehensive character should outclass anything of the kind ever before attempted. He was able to do some excellent missionary work when attending the American Gas Institute last October, and by dint of voluminous correspondence, as well as personal solicitation, he has succeeded in getting together a collection of exhibits that in a moderate amount of space will afford the interested visitors more information upon the many and varied uses to which gas can be applied, par-

ticularly in the home, in the space of a few hours than could be obtained by any other means in as many days

The officials of the company gave enthusiastic support to the project from the beginning and through "Pacific Service" rendered material assistance in releasing Mr. John B. Redd, Industrial Fuel Engineer, so that he might devote his entire time and attention to the Collective Gas Exhibit as its superintendent during the life of the Exposition.

The "Home Electrical" exhibit is the work of the General Electric Company and, besides being a marvel of interest to even the most casual observer, it will prove a lasting testimonial to the matchless energy and foresightedness of the great corporation responsible for its construction. For, in this one little building can be found every device for the running of the household, where every duty, every movement, almost, of the housewife from the hour of rising in the morning to that of retirement by night is facilitated by the pressure of an electric button.

It is our great pleasure to exploit both these exhibits in the present issue of PACIFIC SERVICE MAGAZINE. It is in line with our policy to devote space in every issue from now on until the close of the Exposition to some feature or features that, in our judgment, are especially well worth seeing from the standpoint of their instructive quality.

Not only ourselves but every person, firm and corporation on the Pacific Coast interested in the development of electricity look forward with eagerness to the approaching convention of the National Electric Light Association in San Francisco next month.

Apart from a natural feeling of pride that in securing the attendance of this great representative body at the Exposition city this year we have done our part in helping out the general scheme of boosting California and the great West, we have the satisfaction of knowing that

the selection by the convention of San Francisco as its meeting place in 1915 means more than the mere affording its members an opportunity to visit our much heralded wonderland. We regard it as an acknowledgment on the part of the greatest aggregation of electric light and power men in this or any other country of the part that we men of the West have played in electric power development.

For, it is not forgotten that we are pioneers in one of the most important features of that development, namely, the long distance transmission of electric energy along high tension wires. Beginning, in 1895, at the modest voltage of 11,000, we now think nothing of asking our wires to carry 100,000 volts, and in one section of the State the voltage has reached 150,000. Also, we have made some progress in introducing electricity upon the farm. Concerning this the Master, Thomas A. Edison, recently said:

"Electricity in farming is one of our great coming developments. Something is being done, but that branch of our industry is still in a state of incipency."

We are expecting an attendance of between 2,500 and 3,000 at the forthcoming convention of the N. E. L. A. and we are glad of the opportunity afforded of showing our visitors from the East just what we have accomplished and are doing to help out the general scheme of electric development. "Electricity on the farm" is becoming a watchword in the great valleys that stretch from end to end of California, and rapidly the electric motor is displacing the gasoline engine. Speaking for "Pacific Service" we may say that the irrigation load is

climbing daily, and when we speak for "Pacific Service" we speak for but one of the many organizations of the kind that are all in the same business of building up and developing by the aid of cheap electric power.

Speaking of Edison, the world-famous inventor is quoted in the rather remarkable statement that he has never made anything out of inventing *per se*.

He gave utterance to this statement the other day in conversation with President Holton H. Scott and Secretary T. Commerford Martin of the National Electric Light Association. These gentlemen had journeyed out to the Edison Works at West Orange, New Jersey, for the purpose of urging the wizard to attend the annual convention of the N. E. L. A. this year. During the course of conversation Edison was asked what the prospects were for extracting electricity direct from coal. He shook his head gravely and replied:

"There is nothing doing on that now. It is a most tempting problem, and my mind often turns to it; but, as you see, I am not loafing just at the moment. Then, unhappily, there is the absolute certainty that under our present patent law and its administration the poor devil of an inventor never would receive any reward for it. I have never made anything out of inventing. The money that keeps all those men busy out there I got by manufacturing, and I have long ceased to expect anything else. I suppose I invent as much as ever, but the pathway to the Patent Office isn't quite so hot with my footsteps as it used to be."

READERS OF PACIFIC SERVICE MAGAZINE, TAKE NOTICE

This number is the last of Volume VI, and as has been done in the past, each district office will be supplied with a bound copy for the office library.

Those who have all the copies of Volume VI or any previous volume in perfect condition may have them bound by forwarding them, charges prepaid, to the Stationery Department. The charge for binding will be sixty cents per volume, and remittance must accompany magazines. Forward magazines and make remittance to

STATIONERY DEPARTMENT—Pacific Gas and Electric Company,

445 Sutter Street, San Francisco

Name of sender with full and complete address must be plainly marked on end of each package. No magazines or remittances will be accepted after June 20th.

Definite Voltage or Definite Time Setting for Relays

By THOS. E. FOGALSANG, O. & M. Department, Steam-Electric Section

THE question of protective time-limit relays for lines and cables is one of the most important that is now being considered by electrical manufacturers. Since the advent of the larger generating units and the greater growth of the stations, it has become one of the most serious problems that the fraternity has to deal with. To have trouble come and get rid of it instantly, without damage to apparatus or interruption to service, is the all-important thing desired.

If building space and cost of installation were no object, oil-switches of such a size could be installed that would take care of the ruptured current on any short circuit that might occur under any condition, instantly, and before there was any drop in voltage that would interfere with the service, this being done without the imposition of any time-limit.

A time-limit on a relay for the retardation of the operation of any oil-switch is there for only a few reasons. In case of a slight interruption, where the amperes might swing high for a very brief period but not cause the voltage of the system to drop to any great extent, a time-limit relay fills in admirably and prevents an outage that might be of some consequence to good service.

This condition might arise from a variety of causes, principal among which are the results of bad synchronizing.

A system carrying a larger per cent of synchronous apparatus is more sensitive to the results of long time-limits on the operation of the circuit-breakers than one using induction motors, and the so-called Edison systems are much more sensitive than others, due to the fact that the generators driven by synchronous motors are connected to storage batteries and are apt to fall out of step much quicker, owing to the tendency of the machines

connected to the batteries to become motors and drive their motors as generators against the short circuit.

This tendency is not so pronounced among a group of machines feeding a common network free from a battery, because at the instant of the short all of the machines act about the same, and all try to do the same thing, which is to attempt to drop down with their load.

Whether or not a synchronous motor will drop out of step under such a condition depends altogether upon the load, field excitation, and characteristics of the machine, and it is here that the question of time-limit becomes most important. Whenever the voltage of the system drops too low for a certain period, loaded synchronous machines will drop out of step. Under this condition, then, no time-limit should exceed the amount that would allow the voltage of the system to drop below the figures at which the apparatus will stay in step. The higher this figure can be, the better. The best condition of operation would be to have the oil-switch open instantly when the short occurs, and clear the trouble at once before any great drop occurs or the synchronous load is endangered. But this is often impossible, due to fear that the oil-switch may not safely rupture the load but may hang fire and do even greater damage. So it is here that we again revert to the subject, the size of oil-switches, and for reasons before stated, oil-switches are kept down in size. From this, then, originates the idea of placing a long time-limit on the operation of a breaker, for the longer the short remains the lower the voltage is going to be at the instant that the switch opens, consequently all the current ruptured in the switches is going to be at the lower voltage.

The safe time setting for one kind of

trouble may not be right for another, as the load on the system will cut a large figure.

Inverse time element circuit-breakers seem to have about served their days of usefulness at the generating end, and the one relay to be considered is no doubt the one with a definite time-limit setting.

Too much attention may be paid to this definite time-limit and not enough to the critical voltage-point, or that stage at which the apparatus will drop out of step.

Before a definite time-limit can be maintained, it is necessary to determine at just what point the machines go out. This may be anywhere from one to five seconds, depending a great deal upon the number of generators in parallel, the extent of the trouble, characteristics of machines, amount of load upon the motors, together with their field excitation.

It has no doubt been noticed that of two short circuits taking place, apparently of the same nature, one has been noticed to have kicked the synchronous machines off the system while the other allowed them to remain. You have also noticed that the voltage of the system on each occasion did not reach the same low value.

In view of the fact that it is not possible under present conditions to allow an oil-switch to open on the first instant of a short circuit, but to permit a definite time-limit to elapse, so as to have the switch open under a lower potential, it seems that some relation must be established between the time and the voltage to which the system falls. It is necessary to determine this, so that a point is reached where, at the instant that the switch opens, no jeopardy has been placed upon the operation of the synchronous apparatus.

In other words, it looks as though there should be a definite voltage-setting instead of a definite time-limit, and a relay built along those lines.

This would necessitate an instrument with two windings, one to carry the cur-

rent and act as an overload element, as in any relay, the other to be a potential winding with an adjustment for setting at different voltages. The current coil would operate against a lever which would operate against a trigger, which could not be released until the voltage of the system had dropped to the value that the coil had been set for. When this happens, the trigger is released, and the current coil is free to allow its solenoid to rise and move the lever, making contact and opening the breaker. The desire should be to get away from a definite time-setting for with such a setting we are only endeavoring to establish a safe voltage limit at which the switch may open, without disastrous effects to itself and the system.



James Hugh Wise Library

The U. S. Bureau of Mines and Geological Survey have each sent in several new publications. The Department of Mines of Canada has given some interesting maps and pamphlets of their different provinces.

Mrs. Clara B. Wise has presented the following books: "The Eyes of the World," by Wright; Browning's Poems; "Atlantis," by Donnelly; Volney's "Ruins;" "Sesame and Lilies," by Ruskin.

Mr. A. S. Kalenborn, electrical engineer for the San Joaquin Light and Power Company, has offered to the library several dozen books on miscellaneous technical subjects.

The number of bound books to date is 791, pamphlets 2875. Jos. P. BALOUS.



Why Contract Poison Oak?

For the benefit of those readers of PACIFIC SERVICE MAGAZINE who enjoy the canyons and the woods, but whose enjoyment is marred by the ever-present poison oak, I would suggest that the following prescription be taken along as a preventative. So far, I have not known it to fail:

Salt acid, 10 per cent..... 2 parts
Acetic acid..... 1 part
Alcohol, 50 per cent..... 15 parts

Rub on parts that generally poison before going out, then wash it off immediately with cold water. This is important, and if not done a rash is likely to come from the preventative. In addition to its being used as a preventative, this prescription can also be used immediately after the subject having been exposed to kill the poison oak germ before it gets a chance to develop. Be sure, however, to wash off the lotion with water.

IVAN C. FRICKSTAD.

Tidings From Territorial Districts

Alameda County District

John Surgenor is making good over in Oakland. His name shows he is Scotch, and it is a right pretty sounding name if you know how to put in the burr. John has had an eventful career. It is no other than he who fought in the Boer war and a right good fight he put up. It was thrilling experiences with sharpshooters who fought from brinks, rocks, and trees. John is modest, but some day he will give us the story. Finally he came to this country; a stranger in a strange land, to begin life again. He took the first opening—as he says, at the bottom to go up—the elevator.

The elevator man is interesting. His life is a series of ups and downs. When he is down and out, he is either feasting or recuperating. When he is on his uppers, he is at work. He is always ready to give you a lift and sure to floor you. Putting off with him has its come back. When he drops you, he lets you down easy. He is the best posted man in the building; he not only knows everything going on, but he has everyone sized up, just as he knows on what floor to put you off. He catches everything on the run. He talks little; there is no time for that; gossip and bits of news are culled on the wing. He mutely makes his flights up and down in his cage. You would expect a poll-parrot or mocking bird; he repeats nothing but trips. A sign does his talking—"Please name the floor you want." Some day, some genius will invent a signal of automatic numbers and thus rob him of calling out the floors. He should not be a dumb waiter. He is the index as to everyone's whereabouts. His smile and courteous reply is the glad hand that reflects the hospitality of the building. There is one momentous question still unsettled: Shall gentlemen remove their hats when ladies are in the cage? John declines to solve it.

The elevator man has his serious mo-

ments and he has thought on war, what is it? This sage of the iron box that floats heavenward or earthward at the behest of his patrons, not only must he know all about the weather conditions, everybody's business and their whereabouts, but he is also asked what he thinks of this terrible war. Gentle reader, you will pardon his modesty if he thinks he has some elevating thoughts on the subject.

War, what is it? He cannot dismiss it in the terse language of the great soldier, who said, "War is hell," for he finds there are two schools of philosophy and much depends upon the angle from which you approach the subject. Kipling describes it very aptly when he said:

"Oh, it's 'Tommy this' and it's 'Tommy that'
 "And it's 'Tommy go away';
 "But it's 'Thank you, Mr. Atkins,'
 "When the band begins to play."

The first evidence of civilized man is implements of war; namely, arrow heads and stone hammers. War awakened his inventive faculties, and it is small wonder that civilized man dedicates his greatest achievements to the same cause, the aeroplane and the submarine. War has colored all his thoughts; he stands forth in life as a warrior, battling with disease, and so he speaks of the "Battle of Life." And even if we take the picture of peace drawn for us by the pacifists, the meadows with golden grain in the glow of the setting sun, and the verdure clad hills with the sheep grazing thereon, is not this Victory attendant upon a great struggle? The farmer has first to subdue the stubborn soil and battle with pests innumerable, and not only that, there cannot be any cessation, he must keep on battling, warring, scheming, contriving, or the beautiful picture will fade away.

The sailor battles with the elements, and right nobly and well does he fight. War never appealed to the sluggard, nor to his kith and kin. The greatest and noblest ideals have been awakened by it,

the greatest sacrifices have been made in the cause of war. All that is worth while is worth fighting for.

At this juncture the elevator man rises with a start, there is a pained expression on his face, he puts his finger on the button: Why, the bell is on the bum! He hastens from floor to floor and at the first he is confronted with, "What do you mean? I have been here for three hours, and I am sure there were twelve people but they could not wait. Take me to the purchasing department. I want to buy some bulbs." "The purchasing department, sir, is for buying in and not for selling out. You want to go round the corner to the counter. Yes, sir. Going up? 202? Second on left!"

F. H. Burrill has been appointed superintendent of janitors of Oakland's new million dollar auditorium. He resigns his position with this company as superintendent of the Oakland main office building. His new position is under civil service and was won on ninety per cent in competitive examination. Frank is popular and carries with him the good wishes of a large host. G. B. F.

Santa Rosa District

It may be of interest to you and to the readers of our magazine to know that we are to have other claims to distinction in addition to that of our distinguished citizen, Luther Burbank. The Exposition Feature Players Film Company have decided to locate here, a short distance out of town, on the electric railroad to Sebastopol, on a five-acre tract purchased by them. They seem very much pleased with the different attractions in the way of scenery that we are enabled to furnish them for their scenic work. They refer to the beautiful scenery in Salomy Lane, the largest share of which was taken in our vicinity.

These people will have a large investment in studio and effects and a large number of people employed by them, and the citizens of Santa Rosa feel very elated over this new enterprise in their midst.

On the 6th, 7th and 8th of May, Santa Rosa will hold her usual Rose Carnival and the committees having it in charge

are putting forth every effort to make it worthy of Exposition year, expecting to have many visitors, both eastern and foreign, attend from the many who are visiting the Panama-Pacific Exposition.

The local manager of Santa Rosa District in company with Mr. Weber, manager of Petaluma, attended the General Electric banquet at the Palace Hotel on April 15th and heard with pleasure the different speeches, especially those of our Mr. Britton and Prof. Elihu Thomson.

M. G. HALL.

Fresno District

April 30th, Fresno celebrated Raisin Day. Mariposa, Stanislaus, Merced, Kings, Tulare and Calaveras counties all participated in the event and all sent a large delegation, each county having elected a queen who took part in the pageant which was staged at Roeding's Park. In spite of the inclement weather on that day, many special trains came from the different counties, also hundreds of automobiles, and the town was packed. The pageant at Roeding's Park was an entire success. It was the greatest advertisement raisins and Fresno County ever had.

Mr. D. G. Martin, cashier, has been transferred to the Redwood District as chief accountant. We regret, a very great deal, having to lose Dave in this district, but are glad to see him get the promotion. The employees gave a dinner at the Hughes Hotel to Mr. Martin before his leaving for Redwood and the remarks made by all the employees at this dinner show the high regard in which he was held here generally.

Mr. Silverman comes to us from the Contra Costa District to fill the position held by Mr. Martin.

We are, at the present time, laying about four miles of main line in Russia Town, where we expect to put on something over a hundred consumers for a starter.

Work has begun on the construction of the State Normal School, and will be pushed to completion just as rapidly as possible. The building completed will cost \$370,000, and will be one of the finest normal schools in the State.

April has displayed the most erratic weather Fresno County has seen in many

years. As late as the 1st of May, we have had a slight sprinkle of snow in Fresno and a heavy hail storm. The snow in the mountains is almost to the valley level.

M. L. NEELY.

San Francisco District

In our last issue we mentioned that our Mr. C. L. Barrett, assistant secretary of the company, was convalescing from an attack of pneumonia, which confined him to the hospital for a short while. This attack came as the culmination of a protracted siege of the grippe, coupled with bronchitis, against which he had battled unsuccessfully since the beginning of the year, and as a radical change of climate was considered advisable, he left for Honolulu via the steamer Sonoma on April 13th. He writes that the trip was an extremely stormy one, which is something of an admission from a veteran yachtsman, as the Sonoma ran directly into the storm that caused such widespread disaster along the coast, and he was nearly washed out of his berth on one occasion, as a giant wave broke over the vessel and made matters decidedly uncomfortable while the deluge lasted.

"Charley's" many friends will, however, be pleased to learn that he is getting back into condition again, and although the cough is still a little troublesome he anticipates the resumption of his duties again upon his return, which will be in about ten days or two weeks.

Commencing June 7th and lasting from one week to ten days, there will be held in the New Municipal Auditorium at the Civic Center an architectural exhibit, which will be national in scope and will be of unusual interest and merit. The public is cordially invited and urged to attend.

Examples of "Pacific Service" architecture will be on exhibition.

Colusa District

The employees in the Colusa District are regretting the departure of their accountant Mr. C. J. Brendel, who has accepted a position as head accountant in the office of the Marysville District. Mr. Brendel held the position of accountant in the Colusa office for the past three years and has formed lasting friendship with many in Colusa as well as the employees of the company.

Mr. H. P. Humphreys of the auditing department will succeed Mr. Brendel.

A G. M. has been approved covering the transformer installation and line necessary to install 570 additional horsepower for the Moulton Irrigated Lands Co. These pumps will be used for rice irrigation, making a total of 920 horsepower now being used by the Moulton Irrigated Lands Co. for this purpose. It is their intention to increase the acreage to approximately 12,000 acres next year.

L. H. HARTSOCK.

Marysville District

County Horticultural Commissioner G. W. Harney was called upon this month to inspect a shipment of some fifty thousand olive trees which recently arrived from Southern California for the new nursery now being established at the town of Mission, northeast of Marysville, on the Yuba Land Company's holdings. This new company is a great thing for Yuba County and Marysville and is bound to make a hit.

The first definite steps toward providing for the expense of repairing the bridge across the Sacramento River from Meridian to Colusa, which was washed out during the high water several months ago, were taken yesterday at a joint meeting held in this city of members of the boards of supervisors of Colusa and Sutter counties with officials of the Northern Electric company.

Tentative plans were arranged at a meeting of the Board of Trustees held here for a mass meeting of citizens to be held in Mission Hall this month. The meeting will be for the purpose of discussing the proposed paving of the principal streets of Yuba City, and all citizens are urged to be present. Starr Walton, chairman of the Board of Trustees, will decide.

A bond issue will be placed before the voters to provide for the street work following the meeting, the election date to be fixed by the Board of Trustees. Action upon the part of the board, however, will depend on what conclusions are reached at the mass meeting.

Contractors in charge of the work on the State Highway north of Yuba City announce that rapid progress is being made. Already nearly three miles have been laid out, and if the weather continues clear it is hoped to have much of the work done before the end of the present month.

The contractors are of the opinion that the road can be built well within the time allotted them in the contract providing that the weather conditions are favorable

and labor troubles do not manifest themselves. Thus far no trouble has been experienced in getting materials to the scene of action.

The committee in charge of arranging preliminary plans regarding the proposition of making the connecting link of the State Highway through the city conform with that of the highway proper, announces that most of the property owners appear to favor the idea. A meeting of the committee will be held this month, after which another mass meeting may be called to definitely decide the question.

An addition to the municipal water works of Yuba City will be constructed soon. The city has purchased for \$500, lot 20 of block 1 of the Cooper Tract from T. J. Crabbe, on which the addition will be erected.

New contracts have been signed in this district during the month of April for approximately 275 H.P., including 40 H.P. for the Marysville Sand Plant, the only firm of this kind using power on the river for this purpose. There is a large demand for this sand, and they expect to do a profitable business and use quite a lot of power. In addition we expect to take on 100 H.P. additional in District 10, promised for the month of May.

Mrs. Blue was having some gas fixtures put up in her house one day recently, and she stood near by watching the workman.

"Don't you think that you have placed these fixtures too high?" she asked.

The workman was a stolid German and, making no reply whatever, continued to adjust the fixtures.

"Didn't you hear my question," demanded Mrs. Blue. "How dare you be so rude?"

The German gulped convulsively, and then, in the most gentle of voices replied: "I haf mein mouth full of screws, and I could not speak till I swallow some."

J. E. POINGDESTRE.

Sacramento District

Mr. and Mrs. E. C. Dunning celebrated the tenth anniversary of their wedding on the evening of April 26th by an enjoyable dancant at Hotel Sacramento.

Two hundred guests, many of them being those who had attended the marriage ten years ago, were bidden to the affair, which was charmingly informal.

Jonquils were used to decorate the room and here and there a cluster of orange blossoms to give a bridal touch.

On April 8th the members of the Sacramento District office spent a very enjoyable day at Cosumne about twenty-five

miles from Sacramento. Transportation was secured for a goodly number of the party by one of the large gasoline trucks which was fitted out most comfortably for the trip, and others came by automobile.

Camp was established about eleven o'clock under a grove of trees just within sight of the Cosumne River, where a bounteous picnic lunch was served. Music was provided throughout the day by a Victrola, and in addition to this there was a great variety of outdoor sports. From the strenuous exercise and fresh air, by six o'clock everybody was ravenously hungry and before starting on the return trip all partook of a feast of "hot dogs" and coffee. About sixty-five enjoyed this good time, and at the close of the day, a unanimous vote was cast to make it an annual affair.

On the evening of April 10, 1915, the young men of the Sacramento District office entertained in the assembly room, which is the fourth floor of the office building. All the employees spent a pleasurable evening, which was in the form of dancing to the strains of an accordion.

IN MEMORIAM J. M. LANGNER.

Born September, 1842.

Died April 14, 1914.

John Martin Langner was born in East Prussia in September, 1842. He came to Sacramento in 1886 and went to work for the Sacramento Electric, Gas and Railway Company in 1904, working successively as handy man around the gas works and as a meter repairer for the gas distribution department and, finally, in 1911 was made day watchman at the front gate of the Sacramento Gas Works and Sacramento Supply District.

It was during his work in the yard at the gas works that he lost his leg, an injury to his foot resulting in blood poisoning and necessitating the amputation of his leg at the knee. From this, in later years, he was familiarly known to his friends of the Sacramento District and regular visitors to the gas works and supply district as "Peggy."

Due to his care and constant work is the beauty of the lawns and flower gardens at the entrance to the gas works, in which he took great pride.

Deceased is survived by a widow and two children, R. H. Langner and Mrs. O. M. Hector.

Oakland Boys Some Ball Tossers

Admitted by a San Francisco Expert

Some weeks ago the San Francisco office received a challenge from the Oakland office for a game of baseball. Several times inclement weather postponed this exciting match, but the two teams finally got together on April 10th, the lineup of the respective teams being as follows:

SAN FRANCISCO OFFICE

H. Lemos.....	First base
R. Swan.....	Shortstop
A. M. Gilhully.....	Third base
M. Mensing.....	Catcher
I. C. Steele.....	Left field
L. M. Purcell.....	Right field
E. M. Vallejo.....	Center field
A. E. Hall.....	Second base
B. J. Crowley.....	Pitcher

OAKLAND OFFICE

B. A. Dixon.....	Center field
E. Gay.....	Left field
J. Hurney.....	Shortstop
W. Wilkinson.....	Catcher
B. E. Tyler.....	Third base
A. H. Boardman.....	Second base
F. W. Pape.....	First base
J. A. Britton, Jr.....	Right field
C. Johnson.....	Pitcher

In the second inning, following a series of culpable misplays on the part of the San Francisco aggregation, coupled with a batting streak of the Oakland team, several runs were put over. This gave the Oakland team sufficient lead to imbue them with a good deal of confidence and correspondingly depressed the San Francisco team. To be perfectly honest about it, the Oakland team played rings around us; but in justice to our own "All Star" aggregation let it be here recorded that we had no practice or work-outs, and several of the San Francisco contestants had not played ball together heretofore, whereas the Oakland contingent is a regularly organized ball team and has played several games heretofore with crack teams, in each case giving a good account of themselves.

The result of this game brings forcibly to mind the wisdom of the policy of our General Manager in continually pleading for "team work" amongst the employees of the company.

On the San Francisco team, Lemos, first baseman, and Gilhully, third baseman, played a rattling good game. To Hall, of the San Francisco team, is given the honor of making the only double play

of the game, and this unassisted. To be truthful, we think Hall was just as much surprised as were the spectators; still, accidents will happen.

Pitcher Crowley did not seem to have a great deal on the ball, and attempted to establish an alibi by claiming that he had worked until midnight the night before. We do know that Crowley has more than he showed in this game and are, accordingly, forced to accept the alibi.

The managerial responsibilities must have rested too heavily on the shoulders of Vallejo, as he contributed in no small way to helping the Oakland team put runs over the plate. We know as a matter of fact that he lives in Oakland and have been wondering if his natural pride in "My City Oakland" caused him to forget his duties to the San Francisco office.

We are afraid that old age is beginning to have its effect on Shortstop Swan. He seemed to lack the "pep."

Third Baseman Tyler of the Oakland team is some stickier. Out of four times at bat he managed to hit safely each time.

Pape (that big fellow) was on his toes all of the time and played a good game.

For the benefit of those who did not see the game we will make the positive statement that Jack Britton played an errorless game. You no doubt will wonder at this. Well, the explanation is that he did not have an opportunity either to make an out, an assist or an error, hence his untarnished record.

We are inclined to doff our hats to Pitcher Johnson. He pitched "bully fine" ball and deserved to win.

After all of the smoke had cleared away the official score-keeper reported that the final tabulation showed the Oakland team had gathered six runs as against two for San Francisco.

No little praise is due to Clarence Cope, manager of the Oakland team. He has gathered together and trained an aggregation of ball-tossers who are bound to give a good account of themselves. (Oakland merchants please take notice, so you can lay in a stock of larger size hats.)

Notice is hereby served on Mr. Cope, however, that in the very near future we are going to get together and give our boys a little practice, after which Mr. Cope, et al., be on your guard.

PACIFIC GAS AND ELECTRIC COMPANY

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F. G. DRUM

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F. T. ELSEY
D. H. FOOTE
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A. F. HOCKENBEAMER

SAMUEL INSULL
JOHN D. MCKEE
J. A. MCCANDLESS
C. O. G. MILLER
GEORGE K. WEEKS

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N. A. BRITTON	Vice-President and General Manager
F. HOCKENBEAMER	Second Vice-President and Treasurer
H. FOOTE	Secretary and Assistant Treasurer
C. LOVE	Assistant Treasurer
S. L. BARRETT	Assistant Secretary
PH. W. HALSEY	Assistant Secretary

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S. V. WALTON	Manager Commercial Department

DISTRICT MANAGERS

District	Headquarters	Manager
IMEDA COUNTY	Oakland	F. A. LEACH, JR.
CO	Chico	H. B. HERVFORD
.GATE	Colgate	MILES WERRY
.USA	Colusa	L. H. HARTSOCK
TRA COSTA	Martinez	DON C. RAY
SABLA	De Sabla	I. B. ADAMS
UN	Colfax	JAMES MARTIN
CTRA	Electra	W. E. ESKEW
ESNO	Fresno	M. L. NEELY
RYSVILLE	Marysville	J. E. POINGDESTRE
RIN	San Rafael	W. H. FOSTER
PA	Napa	C. D. CLARK
ADA	Nevada City	JOHN WERRY
ALUMA	Petaluma	H. WEBER
CER	East Auburn	H. M. COOPER
WOOD	Redwood City	E. W. FLORENCE
RAMENTO	Sacramento	C. W. MCKILLIP
FRANCISCO	San Francisco	GEO. C. HOLBERTON
JOAQUIN	Stockton	E. C. MONAHAN
JOSE	San Jose	J. D. KUSTER
TA ROSA	Santa Rosa	M. G. HALL
ANO	Dixon	C. E. SEDGWICK
NISLAUS	Newman	W. A. WIDENMANN
CKTON WATER	Stockton	J. W. HALL
LEJO	Vallejo	A. J. STEPHENS
O	Woodland	W. E. OSBORN

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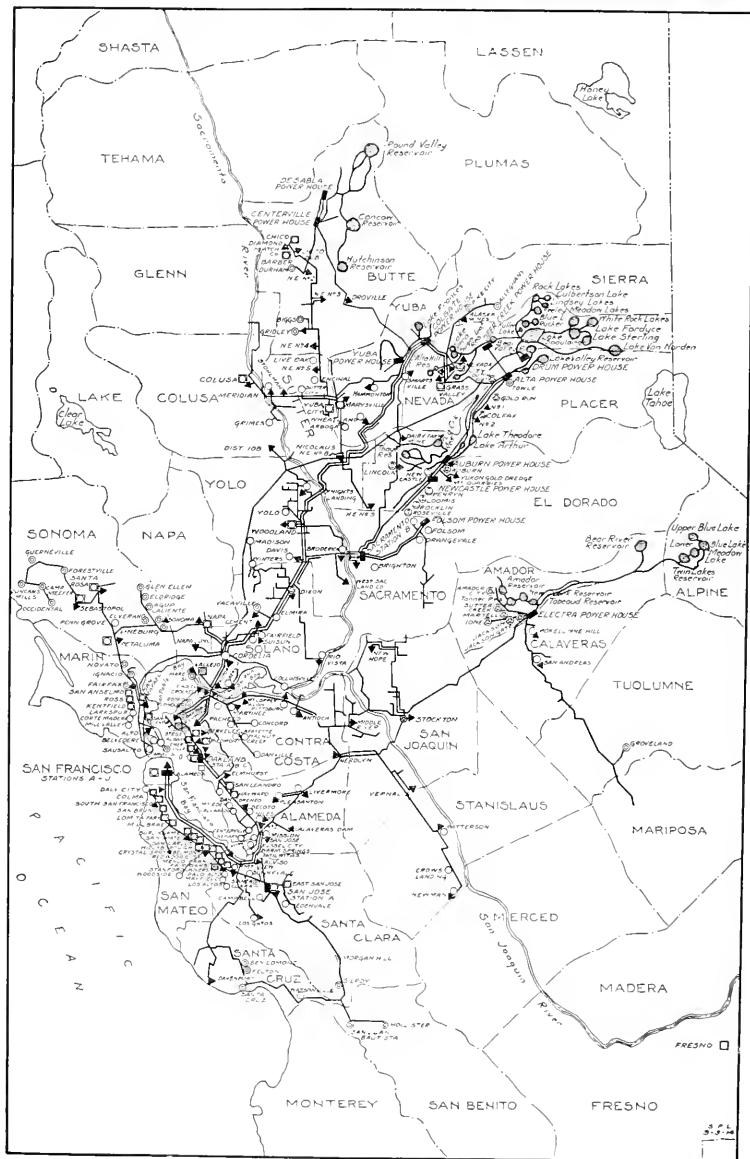
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DE SABLE	De Sable	I. B. ADAMS
DRUM	Colfax	JAMES MARTIN
ELECTRA	Electra	W. E. ESKEW
FRESNO	Fresno	M. L. NEELY
MARYSVILLE	Marysville	J. E. POINGDESTRE
MARIN	San Rafael	W. H. FOSTER
NAPA	Napa	C. D. CLARK
NEVADA	Nevada City	JOHN WERRY
PETALUMA	Petaluma	H. WEBER
PLACER	East Auburn	H. M. COOPER
REDWOOD	Redwood City	E. W. FLORENCE
SACRAMENTO	Sacramento	C. W. McKILLIP
SAN FRANCISCO	San Francisco	GEO. C. HOLBERTON
SAN JOAQUIN	Stockton	E. C. MONAHAN
SAN JOSE	San Jose	J. D. KUSTER
SANTA ROSA	Santa Rosa	M. G. HALL
SOLANO	Dixon	G. E. SEDGWICK
STANISLAUS	Newman	W. A. WIDENMANN
STOCKTON WATER	Stockton	J. W. HALL
VALLEJO	Vallejo	A. J. STEPHENS
YOLO	Woodland	W. E. OSBORN



PACIFIC GAS AND ELECTRIC COMPANY

CITIES AND TOWNS SUPPLIED WITH GAS, ELECTRICITY, WATER AND RAILWAY

SERVICE FURNISHED	NUMBER OF CITIES AND TOWNS SERVED BY COMPANY			TOTAL POPULATION
	DIRECTLY	INDIRECTLY	TOTAL	
Electricity.....	126	49	175	1,221,218
Gas.....	48	2	50	1,125,068
Water (Domestic).....	8	11	19	38,690
Railway.....	1		1	75,602

Place	Population	Place	Population	Place	Population
¹ Alameda.....	27,000	¹⁻² Gold Run.....	100	² Piedmont.....	1,720
¹ Albany.....	800	¹⁻² Grass Valley.....	4,500	² Pike City.....	200
¹ Amador City.....	200	² Gridley.....	1,800	² Pinalo.....	1,500
¹ Allegany.....	200	² Grimes.....	250	² Pittsburg.....	2,372
¹ Alviso.....	200	² Groveland.....	125	² Pleasanton.....	2,000
¹ Angel Island.....	280	² Guerneville.....	500	² Port Costa.....	600
¹ Atherton.....	250	² Hammononton.....	500	² Redwood City.....	3,200
¹ Auburn.....	2,375	² Hayward.....	4,000	² Richmond.....	10,000
¹ Agua Caliente.....	100	² Hillborough.....	1,000	² Rio Vista.....	884
¹ Alvarado.....	900	² Hollister.....	3,000	² Rocklin.....	1,000
¹ Antioch.....	3,000	² Ignacio.....	100	² Roseville.....	2,600
¹ Arboga.....	100	² Joaze.....	900	² Rodeo.....	500
¹ Barber.....	500	² Irvington.....	1,000	² Ross.....	500
¹ Belmont.....	350	² Jackson Gate.....	100	² Russell City.....	250
¹ Ben Lomond.....	800	² Jackson.....	2,035	² Sacramento.....	75,602
¹ Belvedere.....	1,000	² Seafeld.....	350	² San Andreas.....	150
¹ Bentley.....	3,300	² Knights Landing.....	125	² San Anselmo.....	1,500
¹ Berkeley.....	53,000	² Knightsen.....	100	² San Bruno.....	1,500
¹ Biggs.....	750	² Lafayette.....	100	² San Carlos.....	100
¹ Bolinas.....	500	² Live Oak.....	200	² San Francisco.....	530,000
¹ Brighton.....	100	² Livermore.....	2,500	² San Jose.....	37,946
¹ Broderick.....	200	² Los Gatos.....	3,000	² San Leandro.....	4,000
¹ Burlingame.....	4,300	² Larkspur.....	600	² San Lorenzo.....	100
¹ Camp Meeker.....	200	² Lincoln.....	1,400	² San Mateo.....	6,500
¹ Campbell.....	600	² Lomita Park.....	100	² San Quentin.....	2,500
¹ Centerville.....	1,000	² Los Altos.....	500	² San Rafael.....	6,000
¹ Chico.....	13,000	² Loomis.....	400	² San Pablo.....	1,000
¹ Collinsville.....	150	² Madison.....	250	² Santa Clara.....	6,000
¹ Colma.....	3,500	² Madrone.....	125	² Santa Rosa.....	10,500
¹ Colusa.....	1,500	² Martinez.....	5,000	² Sebastopol.....	1,200
¹ Concord.....	1,500	² Martell.....	150	² Sausalito.....	2,500
¹ Cement.....	1,500	² Marysville.....	7,000	² Sheridan.....	150
¹ Colfax.....	500	² Mayfield.....	1,500	² Smartsville.....	500
¹ Cordelia.....	150	² Menlo Park.....	1,300	² South San Francisco.....	2,500
¹ Corte Madera.....	350	² Meridian.....	300	² Stanford University.....	2,600
¹ Crockett.....	2,500	² Millbrae.....	300	² Sonoma.....	1,000
¹ Crow's Landing.....	375	² Millitas.....	300	² Stoke.....	1,000
¹ Daly City.....	250	² Mill Valley.....	2,500	² Stockton.....	35,000
¹ Danville.....	250	² Mission San Jose.....	500	² Suisun.....	1,200
¹ Davis.....	150	² Mokelumne Hill.....	150	² Sutter City.....	150
¹ Decoto.....	350	² Morgan Hill.....	2,500	² Sutter Creek.....	1,500
¹ Dixon.....	1,000	² Mountain View.....	200	² Sunnyvale.....	1,500
¹ Davenport.....	1,000	² Mc Eden.....	500	² Tiburon.....	400
¹ Durham.....	500	² Mare Island.....	750	² Towle.....	100
¹ Dutch Flat.....	500	² Napa.....	2,700	² Vallejo.....	13,600
¹ Duncan's Mills.....	150	² Nevada City.....	700	² Vineburg.....	200
¹ Edenvale.....	500	² Newark.....	750	² Walnut Creek.....	350
¹ Eldridge.....	500	² Newcastle.....	1,000	² Warm Springs.....	200
¹ Elmira.....	150	² Newman.....	800	² Watsonville.....	4,500
¹ El Verano.....	400	² Niles.....	250	² Wheatland.....	1,400
¹ Emeryville.....	5,000	² Novato.....	300	² Winters.....	1,200
¹ Encinal.....	100	² Oakland.....	215,000	² Woodland.....	5,500
¹ Fairfax.....	500	² Occidental.....	400	² Woodside.....	200
¹ Fairfield.....	834	² Oranger Vale.....	100	² Yolo.....	400
¹ Forestville.....	100	² Palo Alto.....	6,300	² Yuba City.....	1,200
¹ Felton.....	300	² Pacheco.....	200		
¹ Fresno.....	40,000	² Pearyn.....	250		
¹ Folsom.....	1,800	² Patterson.....	300		
¹ Gilroy.....	2,000	² Penn Grove.....	300		
¹ Glenn Ellen.....	500	² Petaluma.....	5,500		

Unmarked—Electricity only.
¹—Gas only.
¹⁻²—Gas and Electricity.
¹⁻²—Gas, Electricity and Water.
¹⁻²—Gas, Electricity and Street Railways.

¹⁻²—Electricity and Water.
¹⁻²—Electricity supplied through other companies.
¹⁻²—Gas supplied through other companies.
¹⁻²—Water supplied through other companies.

EMPLOYS approximately 5,000 people.
 OPERATES 10 hydroelectric plants in the mountains.
 4 steam-driven electric plants in big cities.
 17 gas works.

SERVES ¹/₄ of California's population
³⁰ of California's 58 counties
 An area of 37,775 square miles
¹/₄ the size of New York State
¹/₄ the size of all the New England States combined

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